No. 2.— *Reports on the Scientific Results of an Expedition to the Southwestern Highlands of Tanganyika Territory*

II

Mammals

By Glover M. Allen and Arthur Loveridge

The collection on which the following report is based, was made by the junior author while investigating the herpetological fauna of the southwestern highlands of Tanganyika Territory on behalf of the Museum of Comparative Zoölogy, aided by a grant from the Carnegie Institution of Washington.

The whole of the taxonomic work has been done by the senior author while the junior author has collaborated in contributing the field measurements and field notes. Where the singular pronoun is used in the taxonomic discussions it applies to the senior author, in the recounting of field observations to the junior.

The altitudes and other information regarding the localities in which collecting was carried on have already been dealt with in the introduction to this series of reports which treats of the whole vertebrate fauna of the southwestern highlands in relation to that of the Usambara and Uluguru ranges to the northeast.

The period of collecting mammals was from November 9, 1929, to July 1, 1930, during which time over 700 specimens representing 114 species or races of mammals were secured, of which 49 forms were new to the collections of the Museum of Comparative Zoölogy. Seven of these appear to be entirely new and are therefore described beyond:

Suncus varilla minor	Kitungulu, Urungu.
Aethosciurus byatti laetus	Madehani, Ukinga Mtns.
Praomys tullbergi melanotus	Uzungwe, Ukinga, Rungwe, etc.
Leggada gerbillus	Dodoma, Ugogo.
Otomys anchietae lacustris	Uzungwe, Ukinga, Rungwe, etc.
Claviglis soleatus collaris	Madehani, Ukinga Mtns.
Cryptomys hottentotus occlusus	Kigogo, Uzungwe Mtns.

Attention is also directed to such rare forms as *Rhynchocyon cirnei hendersoni, Chlorotalpa stuhlmanni, Colobus badius gordonorum, Aethosciurus lucifer, Thallomys damarensis scotti, Heterohyrax lademanni* and others of which good series were secured.

When measurements are given serially they are always in the following order:— (1) length from snout to anus; (2) length of the tail

without terminal hairs; (3) length of hind foot without claws; (4) length of ear from tip to notch. In the case of bats a fifth measurement is added: (5) length of wing from axilla to tip. All dimensions are in millimetres.

We should like to take this opportunity of thanking His Excellency the Governor of Tanganyika Territory and the Director of Game Preservation for their courtesy in furnishing the necessary license for scientific collecting. Thanks are also due Dr. Joseph Bequaert and Dr. J. H. Sandground of the Harvard Department of Tropical Medicine for their kindness in identifying the parasitic ticks and worms.

List of Species Collected *

* Species in parenthesis were not collected but are discussed.

ERINACEIDAE

Atelerix albiventris hindei (Thomas)

Erinaceus hindei Thomas, 1910, Ann. Mag. Nat. Hist. (8), **5**, p. 193: Kitui, near Mt. Elgon, Kenya Colony.

♂ ♀ (M. C. Z. 25708–9) Mangasini, Usandawi. 14. xii. 29.
♂ ♀ ♀ (M. C. Z. 26425, 26743–4) Ukara Id., Lake Victoria. 14–19. vi. 30.

Native names. Kamasi (Kisandawi); *kenye* (Kinyaturu); *nabuku* (Kikerewe).

Distribution. This hedgehog does not occur on Ukerewe Island according to Père Conrads; Ukara Island is close to Ukerewe; the absence of this animal from the larger island is possibly attributable to the presence of large numbers of Carnivora on Ukerewe.

Discussion. Of this series three show the paler type of coloring in which the spines are white-tipped, with a dark brownish-black band in the middle, then a whitish base. Two of the Ukara specimens have the whitish tips and bases pale ochraceous, but since both are older animals, this may be a result of age. It was apparently this variation which led Heller to describe *sotikae* which Hollister

has shown to be synonymous with *hindei*. In all, the feet and faces are dark brown.

Measurements. The largest ♂ (Ukara Id.) measured 160. 20. 25. 20 mm.; the largest ♀ (Mangasini) 135. 15. 26. 25 mm.

Diet. One hedgehog attacked and disembowelled a live Egg-eating Snake (*Dasypeltis scaber*) which had been temporarily placed in the same cage.

MACROSCELIDIDAE

Rhynchocyon cirnei hendersoni Thomas

Rhynchocyon hendersoni Thomas, 1902, Ann. Mag. Nat. Hist. (7), **10**, p. 403: Plateau west of Lake Nyasa, Nyasaland.

♂ ♀ (M. C. Z. 26741–2) Dabaga, Uzungwe Mtns. 1. i. 30.
♀ ♀ (M. C. Z. 26739–40) Kigogo, Uzungwe Mtns. 18 & 20. i. 30.
♀ (M. C. Z. 26448) Nkuka Forest, Rungwe Mtn. 7. iv. 30.
also seven native skins without skulls, purchased at Dabaga.

Native names. Sangi (Kihehe); *kasonde* (Kinyakusa).

Discussion. With the elimination of *Rhynchocyon chrysopygus* and *petersi*, the black and rufous elephant shrews, to form a separate genus, *Rhinonax*, as proposed by Thomas (1918, Ann. Mag. Nat. Hist. (9), **1**, p. 370), *Rhynchocyon* becomes limited to the checkered-backed species *R. cirnei* and its geographical forms, which occupy an area from central Tanganyika west to the eastern Belgian Congo and south into Mozambique. Typical *cirnei*, described by W. Peters from Mozambique, has the pattern least marked, consisting of two pairs of stripes on each side of the midline, broken into alternate chestnut and pale-buffy spots with a faint indication of a third clearly continuous lateral pale line. Its range extends at least to the south-eastern corner of Lake Nyasa.

In northern Nyasaland occurs *hendersoni*, the type of which probably came from near Livingstonia where Mr. Henderson lived who sent specimens to Thomas. In this form the ground color is darker and the broken stripes much better developed, the dorsal pair nearly black and continuous on the median border, and the alternating paler spots forming nearly whitish indentations on the outer portion. The second pair of stripes is more rufous but with the white spots equally contrasted and forming similar reëntrants on the outer edge of each; the third row of white spots is nearly continuous and is separated by a dark chestnut band from the row above it; the terminal fourth of the tail is white.

To the northeast, in eastern Tanganyika is a paler race, *swynnertoni*, with buffier ground color and slightly buffy instead of white spots, of which the Museum of Comparative Zoölogy has a pair of topotypes collected by Loveridge at Kipera, Kilosa.

To the northwest, on the plateau west of Lake Tanganyika, is found the much redder *reichardi* whose type locality is Marunga, eastern Belgian Congo. The late Dr. J. A. Allen has pointed out the extremes of color variation in the species, or subspecies, *stuhlmanni* of the Semliki River.

It is interesting to find that the form collected by Loveridge on Rungwe Mountain, at the northwest end of Lake Nyasa is obviously *hendersoni*, the dark color of which may be correlated with the more moist conditions under which it lives as contrasted with either *cirnei* or *swynnertoni*.

Measurements. The only ♂ (Dabaga) measured 250. 190. 70. 30 mm.; the largest ♀ (Rungwe) 270. 256. 70. 34 mm.

Breeding. A female killed at Kigogo was apparently suckling young; the specimen from Rungwe was not in breeding condition, there was no fetus. I found the nest of one of these animals in the Nkuka Forest at an elevation of 7,500 feet. The entrance was between two moss-covered roots of a sapling; these roots formed an arch whose apex was six inches from the ground. On the further side was a depression which appeared to have been scratched out by the elephant shrew, then filled with dead leaves till the total mass of leaves formed a domed nest in size and shape comparable to a regulation Rugby football. The animal curls up in the middle of this mass. I confess that I did not know what animal had made it until I had drawn Salimu's attention to the nest when he said immediately that it was the nest of an elephant shrew for in his own home forests on the Uluguru Mountains he had seen these creatures bolt from such nests when he had approached them.

Parasites. Tapeworms were found in the stomach of the Rungwe elephant shrew.

Habitat. The Dabaga specimen was shot in the New Forest Reserve just above the Sonson River on the left side of the Dabaga-Muhanga track. I shot one Kigogo shrew as it was running across an open sunlit patch in the rain forest. During three weeks spent hunting in this forest less than half a dozen shrews were heard or seen so it may be assumed that they are uncommon. The Rungwe animal lacks a right ear, an old injury, probably the result of fighting.

Rhinonax petersi petersi (Bocage)

Rhynchocyon petersi Bocage, 1880, Journ. Sci. Math. Phys. Nat. Lisboa, **7**, p. 159: Tanganyika Territory, region of Zanzibar.

Diet. On April 1, 1930, Salimu reported having seen a Peters' Elephant Shrew, a species with which he is perfectly familiar, feeding on soldier ants (*Dorylus nigricans burmeisteri*) which were crossing the path in the vicinity of the bamboo belt in the Nkuka Forest. Unfortunately we failed to secure any examples of this species during our stay in the forest.

Petrodromus matschiei venustus Thomas

Petrodromus venustus Thomas, 1903, Ann. Mag. Nat. Hist. (7), **12**, p. 339: Namwiwe, northern Nyasaland.

3 ♂ ♀ (M. C. Z. 25685–8) Unyanganyi, Turu. 6. xii. 29.

Native name. Nyenge (Kinyaturu).

Discussion. The four specimens of this beautiful buffy shrew from Unyanganyi, east of Singida, appear to constitute an extension of its known range from northern Nyasaland northward, well into central Tanganyika. They are strikingly pale in comparison with neighbouring forms, having a vinaceous dorsal area, bright buffy sides and white belly. The tail is black above and all round on its distal half. In style of coloration and the rather abundant hair of the tail they resemble *P. matschiei*, but are paler above, through a great reduction of the long black hairs. Their relationship is doubtless with the latter animal, of which they are here regarded as a subspecies.

Measurements. The largest ♂ measured 220. 170. 60. 38 mm.; the ♀ 220. 170. 60. 38 mm.

Petrodromus (Cercoctenus) sultan sultan Thomas

Petrodromus sultani Thomas, 1897, Proc. Zoöl. Soc. London, p. 435: Mombasa, Kenya Colony.

Petrodromus sultan Thomas, 1897, Proc. Zoöl. Soc. London, p. 928: correction of misprint.

♂ (M. C. Z. 26876) Kigogo, Uzungwe Mtns. 3. i. 30.

Native name. Dongi (Kihehe).

Discussion. A single native skin purchased at Kigogo, constitutes an interesting inland record for this coastwise species. Its dark

color, lacking the paler gray sides and with whitish instead of ochraceous belly indicate that it is a male.

Elephantulus ocularis Kershaw

Elephantulus ocularis Kershaw, 1921, Ann. Mag. Nat. Hist. (9), **8**, p. 563: Dodoma, Tanganyika Territory.

24 (M. C. Z. 25649–56, 58, 59, 61–68, 72, 74) Kikuyu, Dodoma. 21. xii. 29.

Discussion. This series of twenty skins and four alcoholics are really topotypes being collected in the same patch of country from which Loveridge secured the types. Kikuyu is only a couple of miles from Dodoma and rather less from Loveridge's former camp.

This elephant shrew is distinguished from the somewhat darker race following, chiefly by its much more extensive buffy to ochraceous tint which extends over the median area of the back, correlated perhaps with a rather hotter, drier environment.

Measurements. The largest ♂ measured 140. 125. 34. 25 mm.; the largest ♀ 145. 140. 35. 25 mm.

Elephantulus renatus Kershaw

Elephantulus renatus Kershaw, 1923, Ann. Mag. Nat. Hist. (9), **11**, p. 588: Gwao's village, near Singida, Tanganyika Territory.

33 (M. C. Z. 25648, 57, 60, 69, 77, 79, 82, 83 (+alcoholics)) Unyanganyi, Turu. 4–6. xii. 29.

18 (M. C. Z. 25670, 71, 73, 75, 76, 78, 80, 81, 84 (+alcoholics)) Mangasini, Usandawi. 12. xii. 29.

Native names. Mbulu or *mbulu sange* (Kinyaturu and Kisandawi).

Discussion. The above series of which twenty-two are alcoholics are distinctly of this form, as might be expected coming as they do from points just northeast and east of the type locality.

They are nearly uniformly buffy brown over the back, without the characteristic ochraceous tint of *E. ocularis* to which, however, they are evidently closely related. Both are no doubt to be regarded as only subspecifically related and probably should be entered as subspecies of *rufescens.*

Measurements. The largest ♂ (Mangasini) measured 135. 130. 30. 25 mm.; largest ♀ (Unyanganyi) 145. 130. 35. 25 mm.

Breeding. A young male measuring 60. 53. 25. 12 mm., obtained at Unyanganyi on December 4, had its stomach full of milk.

Parasites. Female nematodes (*Physaloptera* sp.) were present in Unyanganyi shrews.

SORICIDAE

Suncus lixa (Thomas)

Crocidura (*Pachyura*) *lixa* Thomas, 1897, Proc. Zoöl. Soc. London, p. 930: Nyika Plateau, Nyasaland.

♀ (M. C. Z. 26759) Mwanza, Lake Victoria. 9. vi. 30.

Discussion. Shrews of this genus seem rare in Africa; perhaps they are already in process of becoming eliminated by the more numerous and progressive *Crocidura*. In its bicolor tail this Mwanza shrew agrees with the description of *lixa* of northern Nyasaland rather than with the dark-tailed *S. l. aequatoria* of the Taita Hills of Kenya Colony. The upper surface is distinctly gray with a faint brownish tinge, the lower side clear dark gray, the feet whitish, tail dark above, whitish below. The skull length is 19.5 mm.; basal length 17.7 mm.; palatal length 8.7 mm.; greatest width 8.5 mm.; upper toothrow 8.6 mm.; lower toothrow 7.7 mm.

Measurements. This ♀ measured 65. 46. 10. 8 mm.

Habitat. It was taken under the boxes in my tent where it probably found an abundant food supply in the hundreds of field cockroaches that swarmed in the grass. The tent was only fifty yards from the landing stage used by the Ukerewe boats.

Suncus varilla minor subsp. nov.

Type. No. 26,754 Museum of Comparative Zoölogy. Adult ♀ skin and skull from Kitungulu, Urungu, Tanganyika Territory. Collected by A. Loveridge, May 14, 1930.

Description. A minute shrew resembling *S. varilla* in its grayish-brown upper surface, but of somewhat smaller proportions; cranial length 15.2 mm. against 17.4 mm. in *varilla*. General color of entire dorsal surface of head and body pale cinnamon brown tinged with gray on account of the minute gray tips or subterminal rings of the hairs; longest hairs of the back about 4 mm.; sides and under surface of body clear gray tipped with whitish giving a silvery effect. Upper side of tail brownish with longer gray bristle hairs scattered throughout its length; its lower side pale whitish; backs of feet and bases of ears thinly clad with minute white hairs, upper part of ears brownish like back.

The skull is minute, considerably smaller than that of *varilla*, 15.2 mm. in greatest length. The main cusp of the large first upper

incisor is gently curved downwards, its basal cusp low and rounded. The first upper unicuspid is largest, its tip reaching the level of the cusp of the anterior incisor; the second and third unicuspids are nearly equal in size, the second minutely narrower in profile but its cusp quite as high as that of the third; the fourth unicuspid is much smaller, but stands full in the tooth row, is well visible in side view, and its cusp is almost half as high as that of the third.

Measurements. The field measurements of the type are as follows: head and body 45 mm., hence 7–12 mm. smaller than in *varilla* and *infinitesima*, but the short tail is about the same, 30 mm.; foot 10 mm.; ear 10 mm. The skull is intermediate in size between that of these two: greatest length 15.2 mm. (against 17.4 and 14.5 mm. respectively); basal length 14 mm.; palatal length 6.6 mm.; greatest breadth 6.8 mm.; upper tooth row 6.2 mm.; i^1 to p^4 inclusive 4.2 mm.; lower tooth row 6.1 mm.; lower jaw from condyle to tip of incisor 9.2 mm.

Discussion. This pygmy shrew differs from *S. infinitesima* (type from Rumruti, Laikipia Plateau, Kenya Colony) in its distinctly gray-mixed dorsal side, as in *varilla*, not uniform brown as in the former; in its slightly larger hind foot and larger skull, and in the relative size of the upper unicuspids, of which the first is large, the second and third subequal instead of the second markedly smaller (only about half the size of the third).

The members of this genus are so rare in collections that I cannot yet be certain of the range of individual variation in size, but since it does not seem possible wholly to reconcile the characters of this specimen with those of the few other described forms, I am regarding it as a smaller northern race of *S. varilla* of the Cape.

Habitat. This shrew was found beneath a log in dry orchard forest.

Crocidura nyansae kivu Osgood

Crocidura flavescens kivu Osgood, 1910, Ann. Mag. Nat. Hist. (8), **5**, p. 370: Lake Kivu, Eastern Belgian Congo.

♂ (M. C. Z. 26748) Dabaga, Uzungwe Mtns. 9. xi. 29.
♂ (M. C. Z. 26749) Kigogo, Uzungwe Mtns. 14. i. 30.
♂ ♀ ♀ (M. C. Z. 26745–7) Ukerewe Id., Lake Victoria. 16. vi. 30.

Native names. Nyunga (Kihehe); *msusukwe* (Kikerewe).

Discussion. These three large shrews agree in the dark velvety and glossy pelage, which is so different from that of other shrews

as to suggest possible aquatic habits. Two are immature but nearly full grown.

Two others from Dabaga and Kigogo in the Uzungwe Mountains are probably the same or at least closely related to this form, although a little smaller and less glossy (due to wear and fading of pelage). Their skulls are about 27–28 mm. long, upper toothrow 12 mm.

Measurements. Dabaga ♂ 115. 70. 20. 10 mm.; Kigogo ♂ 100. 66. 20. 10 mm., though it should be noted that the measurement of the foot when dried is 18 mm. The young ♂ from Ukerewe Island measured 100. 70. 20. 10 mm., as did also the young ♀, while the adult ♀ measured 125. 85. 20. 10 mm.

Parasites. The encapsuled larvae of an ascarid (Anisakinae) were very numerous on the back and hindquarters of the Kigogo shrew.

Enemies. Another of these shrews was recovered from the stomach of a Striped Schaapsteker (*Trimerorhinus tritaeniatus*), also at Kigogo.

Crocidura nyansae nyansae Neumann

Crocidura flavescens nyansae Neumann, 1900, Zoöl. Jahrb. Syst., **6**, p. 544: Fort Lubwa, Usoga, Uganda.

♂ (M. C. Z. 26750) Albertville, Lake Tanganyika. 21. v. 30.

Discussion. This single large shrew from Albertville, Belgian Congo, is probably nearer to *nyansae* than to *C. n. kivu.* It appears to be in fresh short pelage which is not yet fully grown out, giving it a pale brownish-gray tint. The typical form is supposed to be characteristic of the country at the north end of Lake Victoria.

Measurements. This ♂ measured 120. 85. 20. 10 mm.

Habitat. Taken beneath a bundle of thatching grass lying near an unfinished hut on the outskirts of the town and very near the lake shore.

Crocidura neavei Wroughton

Crocidura neavei Wroughton, 1907, Manchester Mem., **51**, no. 5, p. 7: Kafue River, Northern Rhodesia.

♂ ♀ (M. C. Z. 26257–8) Kigogo, Uzungwe Mtns. 31. i. 30.

Discussion. In his review of the African *Crocidurae* Dollman says that but two examples of this species were known, the type from Kafue River, northern Rhodesia, taken by Neave and a second secured by the same collector on the Kalungwisi River, east of Lake Meru. It is, therefore, a considerable eastward extension of the known range to record these two from Tanganyika.

The very dark blackish-brown color above, dark-gray underside, long hind feet and the long blackish tail with its very few bristles confined to the base, are distinctive characters.

Measurements. The ♂ measured 76. 66. 17. 10 mm.; the ♀ 80. 70. 17. 10 mm.

Habitat. Taken inside a decayed tree trunk at a height of about three feet from the ground.

Crocidura suahelae Heller

Crocidura suahelae Heller, 1912, Smithsonian Misc. Coll., **60**, No. 12, p. 6: Mazeras, Kenya Colony.

♀ (M. C. Z. 25689) Bagamoyo, Tang. Terr. 9. xi. 29.

Discussion. This reddish-brown shrew seems to be a coastwise species in Kenya Colony, so that it is not very surprising to find it at Bagamoyo on the coast in the adjacent part of Tanganyika Territory.

Measurement. This ♀ measured 85. 56. 14. 8 mm.

Crocidura hildegardeae hildegardeae Thomas

Crocidura hildegardeae Thomas, 1904, Ann. Mag. Nat. Hist. (7), **14**, p. 240: Fort Hall, Kenya Colony.

4 (M. C. Z. 26755–8) Kigogo, Uzungwe Mtns. 27. i. 30.
5 (M. C. Z. 26252–6) Madehani, Ukinga Mtns. 22. ii. 30.
2 (M. C. Z. 26752–3) Igale, Poroto Mtns. 24. iv. 30.
1 (M. C. Z. 26751) Albertville, Lake Tanganyika. 21. v. 30.

Native names. Nyunga (Kihehe); *ntzeki* (Kikinga); *akasene* (Kinyakusa).

Discussion. As Hollister showed, this is a common and widely distributed species in eastern Africa. He recorded it from many localities in Kenya Colony as well as from Uganda and Kilimanjaro. In the series of twelve secured by Loveridge mostly in southwestern Tanganyika Territory, there seems to be nothing to separate them clearly from the typical form of this species, although they probably average a little darker brown. The specimen from Albertville extends the known range to the west side of Lake Tanganyika.

Measurements. The largest ♂ (Kigogo) measured 76. 66. 17. 10 mm.; the largest ♀ (Kigogo) 80. 70. 17. 10 mm.

Breeding. Three of these shrews were found beneath a log, rotted and concave on its lower surface, on the outskirts of the rain forest.

There was no nest and all three animals were active though only one ran away. This was a female which I took to be the mother for she was ten millimetres longer in the body than either of the pair of young which measured 65. 45. 15. 10 mm. A male captured the same day was actually taken seven miles away.

Crocidura bicolor cuninghamei Thomas

Crocidura cuninghamei Thomas, 1904, Ann. Mag. Nat. Hist. (7), **14**, p. 240: Island in Victoria Nyanza.

♀ (M. C. Z. 26383) Entebbe, Lake Victoria. 27. vi. 30.

Native name. Kavinurinu (Luganda).

Discussion. This specimen seems to agree well with the description of the type which was taken on a small uninhabited island, a mile north of Sajitu Island in Victoria Nyanza. Since our specimen was taken under a log only ten feet from the lake shore, it may be that this species prefers the borders of streams or lakes.

Measurements. ♀ 65. 45. 14. 10 mm.

CHRYSOCHLORIDAE

Chlorotalpa stuhlmanni (Matschie)

Chrysochloris stuhlmanni Matschie, 1894, Sitzb. Ges. naturf. Freunde Berlin, p. 123: Runssoro near Karevia, Ukondjo and Kinjawanga, etc., Belgian Congo.

♂ (M. C. Z. 26736) Ihanganya, Uzungwe Mtns., 6. i. 30.
♀ (M. C. Z. 26738) Ludilo, Uzungwe Mtns. 8. i. 30.
♀ (M. C. Z. 26737) Kigogo, Uzungwe Mtns. 22. i. 30.
♀ (M. C. Z. 26447) Madehani, Ukinga Mtns. 2. ii. 30.
♀ (M. C. Z. 26314) Nkuka Forest, Rungwe Mtn. 17. iv. 30.

Native names. Ifufula (Kihehe); *lisukadope* (Kikinga).

Discussion. This series of five specimens is very uniform in general appearance, having the facial region soiled whitish or buffy, with a whiter spot marking the eye (? or ear). The fur of the dorsal side is glossy blackish brown with green and purplish reflections, the lower surface grayer. They doubtless represent Matschie's *stuhlmanni*. In this genus there are normally forty teeth (ten in each jaw on each side) but one specimen (No. 26,736) has eleven on each side above although only ten in the mandible on each side. The eleventh tooth,

perhaps representing an original m^3, is similar to the usual last tooth, transverse, and slightly pear-shaped in crown view.

All the specimens agree in having such inflated bullae that the greatest antero-posterior diameter of the bulla equals the distance from bulla to last molar, whereas in the unique specimen from the Uluguru Mountains which we described as *C. tropicalis*, the bullae are so much smaller, that the distance between the bulla and the last molar is nearly one and a half times this diameter. In addition the Uluguru animal is browner with a clear white and more extensive facial mask than in any of the five specimens of *stuhlmanni*.

Measurements. The single ♂ measured 135. 0. 13. 0 mm.; the largest ♀ (Madehani) 130. 0. 10. 0 mm.

Breeding. None of the four females appeared to be breeding.

Enemies. A skull is also preserved which I imagine resulted from a disintegrated pellet disgorged by an owl; this skull was in the bottom of a saw-pit in the Nkuka Forest.

Habitat. The Ihanganya specimen was found lying dead beside the path near Jumbe Ubamba's village; two carrion beetles were crawling over it. The mole was very draggled and had apparently been drowned out of its burrow by the almost continuous rain of the past forty-eight hours; probably exposure had finished the creature when in an exhausted and half-drowned condition.

On arrival at Ludilo I showed the skin of this mole to a group of natives (as I had done at each halting place on the way) and offered fifty cents (12c in U. S. currency) for every one that might be brought in in good condition. I saw a bright-faced youngster look up at his aged father and say something quickly in Kihehe. "Go, bring it," was the terse reply in Kiswahili. The boy broke away from the group and raced off in the direction of the gardens. Presently he returned walking, gingerly holding a dead mole between two sticks. I put the fifty cents in his hand and the look of wondering amazement that he gave me was most refreshing. He looked from me to the fifty-cent piece, turned it over, then looked at his father, who told him to keep it. It was probably the first fifty cents he had ever possessed as their home was in a very remote spot. I told him to go and bring me some more at the same price but he shook his head; it transpired that the one he had brought had been killed and thrown away that morning when hoeing was in progress. The lad remained for an hour watching me at work, so it was pretty evident that he thought further search would be useless, for several times I reminded him that there were only two hours of daylight left and that, as I

would be leaving at dawn, his opportunity would then be gone. His attitude merely corroborated that of the natives whom I had interrogated along the way, they one and all considered that searching for an *ifufula* was a hopeless business.

The Kigogo and Madehani moles were brought in by natives, and though I was camped for three weeks at each of these places no others were forthcoming despite special encouragements being offered.

On arrival at the Nkuka Forest, we found old bamboo mole-traps and set many ourselves but without result. Moles seemed to be more plentiful on Rungwe than in any other place that we had visited, fresh lines of upturned earth would appear every few days in the vicinity of the camp but though the local natives were urged to hunt for them, none was produced. The day before we left Rungwe I told Salimu to take a labourer and make the securing of a mole his first business. He started digging where two days before a mole had raised a trail across a path close to my tent. After three hours excavating he located the mole, a female, in its nest — a mass of dry leaves — under the sheltering roots of a large tree within a hundred feet of my tent! I was called and observed an insect running over the leaves which had formed the nest. Salimu stated that there had been many of them but that the others had disappeared. I secured the one that remained.

PTEROPIDAE

Epomophorus minor Dobson

Epomophorus minor Dobson, 1880 (for 1879), Proc. Zoöl. Soc. London, p. 715: Zanzibar.

10 (M. C. Z. 26214–23) Mwaya, Lake Nyasa. 5–7. iii. 30.
1 (M. C. Z. 26707) Ujiji, Lake Tanganyika. 26. v. 30.

Distribution. Andersen, in his monograph of the family, records this bat from the Zanzibar region on the coast and from Ujiji, Lake Tanganyika; the present series extends the known range southwards to Lake Nyasa.

Native name. Ilipulumusi (Kinyakusa).

Discussion. The whole series consists of males; in none of the nine fully adult specimens do the temporal ridges meet to form a sagittal crest, in contrast to the condition in *E. anurus.* All the series agree in their dark-brown color above, prominent white epaulettes and

whitish abdomens; at the sides of the chest the dark brown becomes smoky brown.

Measurements. The largest ♂ measured 115. 0. 15. 20. 200 mm.; juvenile ♂ (Ujiji) 60. 0. 15. 22. 185 mm.

Breeding. The fact that only males were obtained at Mwaya would suggest that the females were roosting apart with young at this time — March 7. At Ujiji a young animal was independent.

Parasites. One Mwaya bat had some parasites, which I failed to detach, along the edges of its right wing; another a parasitic dipteron, *Tripselia amiculata*, which was preserved; others were collected from the fur of the Ujiji bat.

Habitat. The Mwaya series were shot from palms and mango trees surrounding the hospital; they were hanging singly or in groups of two and three.

Epomophorus anurus Heuglin

Epomophorus anurus Heuglin, 1864, Nova Acta Acad. Leop. Carol., Halle, **31**, pt. 8, p. 12: Bongo, Bahr el Ghazal.

1 (M. C. Z. 26426) Ilolo, Rungwe. 31. iii. 30.
9 (M. C. Z. 26682–90) Ukerewe Id., Lake Victoria. 14. vi. 30.

Discussion. There are apparently no adult males in the series. In none is there a well-marked whitish abdominal area, but instead the lower side is nearly uniform pinkish buff, only slightly paler on the belly.

Measurements. The largest ♂ measured 115. 0. 15. 25. 230 mm., the largest ♀ 115. 0. 16. 21. 230 mm. A juvenile ♀ from Ilolo 85. 0. 15. 25. 160 mm.

Habitat. The series was obtained from mango trees near the mission where they roosted.

EMBALLONURIDAE

Coleura afra (Peters)

Emballonura afra Peters, 1852, Reise nach Mossamb., **1**, p. 51, pl. 12, fig. 1 and pl. 13, figs. 18 and 19: Tette, Mozambique.

15 (M. C. Z. 26725–34) Mwanza, Lake Victoria. 6. vi. 30.

Discussion. The capture of a series of this rare bat at Mwanza extends its known range in East Africa from Voi on the coast, to the Central Lake Region. Hollister suggested that *gallarum* may prove to be merely a subspecies of it, but probably it is really a dis-

tinct species, with shorter forearm and brown instead of sooty color. The upper canines of *afra* have a very pronounced cingulum cusp on the inner side, about as large as the incisor; the minute upper premolar too has a distinct cingulum and low rounded crown. Five of the series are preserved in alcohol.

Measurements. The largest ♂ measured 60. 20. 10. 15. 150 mm.; only ♀ 65. 20. 10. 15. 150 mm.

Habitat. Attracted by the squeaking of bats to some large caverns among the jumble of massive rocks on a headland a few miles north of Mwanza, I climbed down into a great, yet well-lighted, cavern. From the rocky ceiling numbers of bats depended by their feet but each was separate from its fellows and not in clumps or even very close together, so that each one was shot separately with dust shot from a .22 cartridge.

Taphozous mauritianus E. Geoffroy

Taphozous mauritianus E. Geoffroy, 1813, Description de l'Egypte, **2**, p. 127: Mauritius.

1 (M. C. Z. 25721) Unyanganyi, Turu. 7. xii. 29.
2 (M. C. Z. 26226, 26270) Mwaya, Lake Nyasa. 7. iii. 30.
2 (M. C. Z. 26718, 26722) Ujiji, Lake Tanganyika. 25. v. 30.

Distribution. Also seen on the coconut palms at Bagamoyo.

Native name. Ilipulumusi (Kinyakusa).

Discussion. This wide-ranging species is doubtless, as suggested by Lang and Chapin, characteristic of bush-veld country in eastern Africa, avoiding forests. They found it in the eastern Congo frequently hanging by day close under the projecting thatch of houses, but in Tanganyika it seems to be associated more often with palms and mango trees.

Measurements. The largest ♂ measured 85. 20. 15. 20. 195 mm.; larger ♀ 95. 26. 12. 21. 197 mm., from Mwaya and Unyanganyi respectively.

Habitat. From a solitary palm (? bussu) at Unyanganyi, and ornamental palms forming an avenue to the hospital at Mwaya.

Taphozous sudani Thomas

Taphozous sudani Thomas, 1915, Ann. Mag. Nat. Hist. (8), **15**, p. 561: Mongalla, Upper Nile.

♀ (M. C. Z. 26724) Igale, Poroto Mtns. 30. iv. 30.

Discussion. This single example agrees closely with the original description of a specimen from the Upper Nile and with specimens

listed by J. A. Allen, Lang and Chapin from the northeastern Uele District. Its occurrence at Igale constitutes another interesting locality record and extends its known range considerably to the south to the vicinity of the north end of Lake Nyasa. Its nearly uniform sooty-brown body with white bases to the hairs and its whitish wings are obvious characters.

Measurements. ♀ 80. 30. 13. 19. 190 mm.

Habitat. Taken in a rock crevice.

NYCTERIDAE *

Nycteris aethiopica luteola Thomas

Nycteris aethiopica luteola Thomas, 1901, Ann. Mag. Nat. Hist. (7), **8**, p. 30: Kitui, Kenya Colony.

22 (M. C. Z. 25722–7, 25729, 28112–5) Unyanganyi, Turu. 7. xii. 29.

Native name. Tai (Kinyaturu).

Discussion. The whole series, of which fifteen are preserved in alcohol, includes adults of both sexes as well as several naked young. They were taken from a hollow baobab tree by four native lads.

Measurements. The largest ♂ measured 75. 57. 15. 30. 165 mm.; and ♀ 72. 65. 15. 33. 170 mm.

Breeding. Several of the females were nursing young.

Nycteris damarensis damarensis Peters

Nycteris damarensis Peters, 1870, Monatsber. Akad. Wiss. Berlin, p. 905, fig. 7: Damaraland, Southwest Africa.

4 (M. C. Z. 25730–3) Saranda, Ugogo. 17. xii. 29.

Discussion. These specimens with forearm 46–48.5 mm. seem best referred to the typical race. Their long ears and pale grayish-brown backs and almost whitish underside distinguish them from the small dark *revoili* and the larger *N. a. luteola.*

Measurements. The larger ♂ measured 50. 50. 10. 30. 140 mm., and both ♀ ♀ 55. 60. 10. 30. 142 mm.

Breeding. One female carried a young male measuring 45. 40. 10. 25. 120 mm.

Habitat. All four were hanging in a grass hut in the government rest camp.

* Nycteris takes precedence over Petalia by fiat of the International Zoölogical Congress.

Nycteris revoili A. Robin

Nycteris revoili Robin, 1881, Bull. Soc. Philom. Paris, **5**, p. 90: Somaliland.

10 (M. C. Z. 28126–35) Unyanganyi, Turu. 7. xii. 29.
4 (M. C. Z. 26427–30) Madehani, Ukinga Mtns. 25. ii. 30.

Discussion. The four examples from Madehani average much sootier brown than specimens from the drier thorn-bush country of eastern Tanganyika and Kenya Colony. One is, however, quite the same shade of dark brown above, so that the darker shade of the others is perhaps due to immaturity though they are fully grown. The skulls are slightly smaller than those of *capensis* to the south, with longer crests.

Measurements. The only Madehani ♂ measures 50. 55. 10. 30. 135 mm., and the largest Madehani ♀ measures 50. 55. 10. 30. 135 mm.

Habitat. If the statement of their native captors is to be relied upon the Unyanganyi series (preserved in alcohol) were taken in the same hollow baobab tree together with the series of *Nycteris aethiopica lutcola* and a pair of *Rhinolophus lobatus* Peters.

RHINOLOPHIDAE

Rhinolophus hildebrandti eloquens Andersen

Rhinolophus hildebrandti eloquens Andersen, 1905, Ann. Mag. Nat. Hist. (7), **15**, p. 74: Entebbe, Uganda.

♀ (M. C. Z. 25728) Unyanganyi, Turu. 7. xii. 29.

Discussion. This single specimen in its measurements represents about the maximum given by Andersen for topotypes of this race from Entebbe — forearm 60.5 mm., third metacarpal 43 mm., fourth and fifth metacarpals 46 mm., tibia 25.8 mm., foot 13.6 mm. In the skull the minute upper premolar, though forced outward from the tooth row, nevertheless separates the canine and the large premolar by a minute space. In the lower jaw, the minute premolar is lacking on the right side, but present on the left as a minute spicule under the cingulum of the large p_4. No doubt, as suggested by Andersen, this is an inland form, characteristic of the Central Lake Region; the present record perhaps constitutes the most southeasterly made.

Measurements. ♀ 65. 60. 15. 30. 160 mm.

Rhinolophus lobatus Peters

Rhinolophus lobatus Peters, 1852, Reise nach Mossamb., **1**, p. 41, pls. ix and xiii, figs. 16 and 17: Sena, Mozambique.

2 (M. C. Z. 28136–7) Unyanganyi, Turu. 7. xii. 29.

Native name. *Tai* (Kinyaturu, but not specific).

Discussion. This pair, a male and female, are preserved in alcohol.

Habitat. According to their native captors, these bats were taken in a hollow baobab tree in company with two species of Nycteris.

HIPPOSIDERIDAE

Hipposideros ruber (Noack)

Phyllorhina rubra Noack, 1893, Zoöl. Jahrb. Syst., **7**, p. 586: "Lugerrunjere River."

♀ (M. C. Z. 26675) Ukerewe Id., Lake Victoria. 10. vi. 30.

Discussion. The single specimen from Ukerewe Island is in the gray phase in which the pelage is uniformly sooty above to the roots of the hairs; drab below.

Measurements. ♀ 45. 38. 10. 15. 150 mm.; the forearm measures 50 mm.

MEGADERMIDAE

Lavia frons rex Miller

Lavia rex Miller, 1905, Proc. Biol. Soc. Washington, **18**, p. 227: Taveta, Kenya Colony.

♂ ♀ (M. C. Z. 26694–5) Ujiji, Lake Tanganyika. 28. v. 30.

♂ ♀ and young (M. C. Z. 26691–3) Ukerewe Id., Lake Victoria. 10–18. vi. 30.

Discussion. These represent the larger East African race of the handsome yellow-winged bat. Two of the Ukerewe specimens are young, the smaller about a third grown, June 10, the other of nearly adult proportions, June 18.

Measurements. The largest ♂ measured 75. 0. 18. 46. 185 mm., and largest ♀ 75. 0. 15. 46. 195 mm., both from Ukerewe Island.

Habitat. Ujiji specimens were shot from mango trees forming an avenue in one of the main roads.

VESPERTILIONIDAE

Myotis bocagii hildegardeae Thomas

Myotis hildegardeae Thomas, 1904, Ann. Mag. Nat. Hist. (7), **13**, p. 209: Fort Hall, Kenya Colony.

2 (M. C. Z. 26699–700) Kasanga, Lake Tanganyika. 16–17. v. 30.

Discussion. These two males are quite like a specimen from Aba, Belgian Congo. The bright fulvous red of the back is in contrast to the gray of the undersurface faintly washed and buffy.

Measurements. The larger ♂ measured 52. 45. 10. 15. 125 mm.; forearm 38 mm.

Habitat. Taken in domestic banana plants.

Pipistrellus nanus (Peters)

Vespertilio nanus Peters, 1852, Reise nach Mossamb., **1**, p. 63, pl. 16, fig. 2: Inhambane, Mozambique.

3 (M. C. Z. alcoholic) Bagamoyo. 16. xi. 29.
10 (M. C. Z. 26431–40) Madehani, Ukinga Mtns. 24. ii. 30.
1 (M. C. Z. 26696) Kitungulu, Urungu. 15. v. 30.
7 (M. C. Z. 26697–8, 26701–5) Kasanga, Lake Tanganyika. 16. v. 30.
1 (M. C. Z. 26441) Mabira Forest, Uganda. 1. vii. 30.

Native names. Lilema (Kikinga); *kasusu* (Kirungu).

Discussion. A considerable series of these little bats was obtained. They agree completely with Peters' description. There is relatively little color variation in the series, most of them being dusky brown above and gray below with dark-based hairs. A few, however, show a brighter tint, yellowish brown above, faintly washed with the same below. The Uganda specimen is slightly darker than the others, perhaps due to immaturity.

Measurements. The largest ♂ (Ukerewe) measured 45. 38. 5. 10. 150 mm.; and largest ♀ (Madehani) 45. 35. 5. 10. 100 mm.

Habitat. It is probable that the Madehani series, brought in by a native, were taken in some adjacent low-lying valley as none was seen as high as the village. Wild bananas, however, are common and these were examined without results. I personally took the Bagamoyo and Kitungulu bats from the central shoot, as yet unfurled, of domestic banana plants.

Pipistrellus rüppelii (Fischer)

Vespertilio rüppelii Fischer, 1829, Synopsis Mamm., p. 109: Dongola, Sudan.

♀ (M. C. Z. 26706) Kasanga, Lake Tanganyika. 17. v. 30.
10 (M. C. Z. 26665–8, 26676–81) Ukerewe Id., Lake Victoria. 10 vi. 30.

Discussion. The series from Ukerewe Island includes only one adult male, six adult females and three immatures, perhaps two-thirds grown. The contrastingly pure white under side and the brownish-gray back make an unusual color pattern in this genus. Indeed, Miller and J. A. Allen include the species in the genus *Scotozous*, but Hollister in his list of East African specimens in the United States National Museum, relegates it, and I believe correctly, to *Pipistrellus*, for, as this fine series clearly shows, the small outer upper incisor is not vestigial ("not extending beyond the cingulum of the inner") but is only a little shorter than the large cusp of the inner tooth, and stands normally in the alveolar line. The Kasanga specimen is from the extreme southeastern end of the lake.

Measurements. ♂ 55. 35. 8. 15. 110 mm.; largest ♀ 50. 40. 8. 12. 110 mm.

Habitat. The single bat from Kasanga was found at a height of about five feet from the ground beneath plaster on the wall of the ruined German fort at the south end of the bay.

Glauconycteris argentata (Dobson)

Chalinolobus (*Glauconycteris*) *argentatus* Dobson, 1875, Proc. Zoöl. Soc. London, p. 385: Cameroon Mountains.

3 (M. C. Z. 26227–9) Mwaya, Lake Nyasa. 5–6. iii. 30.

Native name. Ilipulumusi (Kinyakusa).

Discussion. These three specimens are tentatively referred to *G. argentata*, the type locality of which is Cameroon Mountains, West Africa, an area of greater humidity and hence likely to be inhabited by darker-colored forms than those of the drier country to the east of the lakes. Two of them are immature, the third somewhat older, and just changing from the dark drab coloring of youth (which still shows as two broad bands along the sides) to the paler buffy brown of the adult, which is already coming in as a narrow triangular patch in the centre of the upper back.

Measurements. ♂ 45. 42. 7. 12. 132 mm.; ♀ 52. 50. 7. 12. 140 mm.

MOLOSSIDAE

Mops (Allomops) osborni J. A. Allen

Mops (*Allomops*) *osborni* J. A. Allen, 1917, Bull. Amer. Mus. Nat. Hist., **37**, p. 473: Kinshasa, near Leopoldville, Belgian Congo.

13 (M. C. Z. 26708–17, 19, 21, 23) Ujiji, Lake Tanganyika. 25. v. 30.

Distribution. This large species, first described from the Lower Congo, was next recorded from the Lake Region by Loveridge who secured it at Kisumu on the east shore of Lake Victoria. The present series extends the known range southward to the shores of Lake Tanganyika.

Discussion. There are a few minor points wherein these skins do not wholly agree with the original description — thus the fur on the back is said to be whitish at the extreme base, but in our series the fur is uniformly brown throughout. In none of the specimens is the sagittal crest so high as in the type, but in measurements there is a fairly close correspondence. In only one male is the tuft of long hairs of the forehead very prominent, perhaps because it is partly white and stands out.

Measurements. The largest ♂ measured 80. 45. 15. 18. 175 mm.; the largest ♀ 75. 45. 15. 18. 175 mm.

Habits. These bats are a great nuisance to householders both at Kigoma and Ujiji. In passing along the streets one frequently gets a pungent whiff from some house in which these animals have been pleased to take up their residence.

Chaerephon limbatus (Peters)

Dysopes limbatus Peters, 1852, Reise nach Mossamb., **1**, p. 56, pl. 14: Mozambique.

1 (M. C. Z. alcoholic) Mombasa Id., Kenya Colony. 28. x. 29.

Habits. This free-tailed bat flew on board the liner when lying in Kilindini harbor and was found sprawling about the deck. Preserved in alcohol.

CANIDAE

Thos mesomelas mcmillani Heller

Thos mesomelas mcmillani Heller, 1914, Smithsonian Misc. Contr., **63**, no. 7, p. 6: Mtoto Andei, Kenya Colony.

♀ (M. C. Z. 27149) Near Njombe, Ubena Mtns. 6. ii. 30.

Native names. Nchewe (Kihehe); *ngewe* (Kikinga); the Banyakusa have several names probably indicating that they are acquainted

with more than one species of jackal: *imbera, imbila, akambwe, ingewe* (Kinyakusa, the first two are renderings of the same word).

Distribution. Jackals, whether of this or allied subspecies, were seen on several occasions; the first at dusk when motoring from Mpwapwa to Igulwe on 23. xi. 29; another west of Ipemi at 10 a.m. when it was trotting along a distant hillside, pausing now and again to watch the safari, this was on 8. i. 30; another just after sunset about twenty miles north of Mufindi on 1. ii. 30. Skins were offered for sale at both Ilolo and Nyamwanga in Rungwe District.

Discussion. The single specimen is no doubt referable to this race of the coast region and rift valley, and agrees well with other East African skins except that the red of the sides and haunches is a little less intense, and the dorsal area is unusually silvery due to the long white rings on the hairs which show through, while the black tips seem less evident than usual.

Measurements. ♀ 650. 300. 135. 100 mm.

Parasites. A tick (*Rhipicephalus sanguineus*) was found on its ear.

Habits. I shot this animal about 9 p.m. as it was trotting along the road ahead of the lorry in which we were travelling. The first shot — No. 3 from the choke bore — hit it behind without touching any vital spot, but caused it to jump round, when I killed it with No. 8 from the other barrel. It sprang into the air and dropped unconscious where it had stood.

Folklore. An old man of the Banyakusa tribe told me at Ilolo that if you heard a jackal calling you should go out and say, "What is it?" This is done by the knowing ones who inquire, "Is it a death?" to which the jackal will reply, "Yes," if this is the case; on the other hand, if war is impending and you ask, "Is it war?" the animal will remain silent.

Otocyon megalotis virgatus Miller

Otocyon virgatus Miller, 1909, Smithsonian Misc. Coll., **52**, p. 485: Naivasha Station, Kenya Colony.

♂ (M. C. Z. 25739) near Gwao's village, Singida. 2. xii. 29.

Native name. Bili (Kinyaturu).

Discussion. The specimen is an old male with much worn molars. Hollister's suggestion that this and other named forms are merely subspecies of *O. megalotis* is doubtless the correct view.

Measurements. ♂ 480. 250. 115. 100 mm.

Diet. A migratory locust and termites were in its stomach.

Habits. Shot at night as it was trotting along the road.

MUSTELIDAE

Aonyx capensis subsp.

Lutra capensis Schinz, 1821, Cuv. Thierreich, **1**, p. 214: Cape region, South Africa.

♀ juv. (M. C. Z. 26544) Igale Pass, Poroto Mtns. 24. iv. 30.

Discussion. This young female with the milk dentition only is too immature for subspecific determination since most of the distinctions are based on relative size of teeth or body. The toes of the fore feet are quite without claws but those of the hind feet have each a small flattened nail. An excellent account with figures of the milk dentition is given by J. A. Allen in the report on "Carnivora collected by the American Museum Congo Expedition," 1924.

Distribution. Otters occur at Mwaya and around the shores of Lake Nyasa. While we were searching for aquatic cobras at Kipili on Lake Tanganyika, Salimu saw an otter among a pile of rocks; they are said to be common there.

Measurements. This ♀ measured 315. 165. 70. 15 mm. when it died on May 6, 1930.

Breeding. On April 24 a native met me on the road as I was returning from a hunt and showed me a baby otter. I offered him a shilling for it which he accepted, adding casually that perhaps I might give one and sixpence (37 cents U. S. currency). I asked him where was the second cub, but he replied that he had but one. On reaching camp I took immediate precautions to make the little beast comfortable for it was trembling with the bitter cold at this high elevation. As I was making arrangements for it, I remarked that I wished that there had been two for they would have helped to keep each other warm. It was only then that I learned that there had been two, that the second, in charge of another native, had been waiting near camp for my return. I sent a boy to get it; he returned saying that the man refused to sell it and had run off saying that he was going to eat it. All next day I endeavoured to trace it but only met with lies, for everybody denied knowledge of who had it or where it was, etc. My own personnel said that it had probably been killed to make medicine.

Folklore. I was informed that a piece of otter skin applied to a stiff neck would cure it and that this belief was held by most tribes.

An old Mnyakusa told me that only chiefs were allowed to wear otter skins in former days, if a commoner was found doing so it was

taken from him and he was fined an ox. Thus it became customary for any man who was so fortunate as to kill an otter to hand over the skin to the chief.

VIVERRIDAE

Civettictis civetta schwarzi Cabrera

Viverra civetta orientalis Matschie (not *V. orientalis* Hodgson, 1842 = *V. zibetha* Linnaeus), 1891, Arch. für Naturgesch., **1**, p. 352: Zanzibar.
Civettictis civetta schwarzi Cabrera, 1929, Mem. R. Soc. Español. Hist. Nat., Madrid, **16**, No. 1, p. 36, footnote: Bagamoyo, Tanganyika Territory.

♀ (M. C. Z. 26480) Ukerewe Id., Lake Victoria. 17. vi. 30.

Discussion. This is a very fine large specimen, with a skull measuring 157.5 mm. in condylobasal length, hence slightly exceeding the largest male in Dr. J. A. Allen's list of Congo specimens. Like them it has the black band of the cheeks continuous across the snout instead of broken as in the typical race; the pale ground color of the body is slightly but clearly buff instead of white.

Cabrera has proposed the name *schwarzi* to replace *orientalis*, invalidated through its previous use by Hodgson for an Indian civet.

Measurements. This female measured 910. 440. 140. 55 mm.

Parasites. Ticks (*Rhipicephalus simus* and *Haemaphysalis leachii*).

Habitat. Civets are common in the open bush which covers much of Ukerewe Island. I shot this specimen at night when it was attracted to the dead body of a baboon placed near the tree in which I was spending the night.

Genetta stuhlmanni stuhlmanni Matschie

Genetta stuhlmanni Matschie, 1902, Verh. V. Int. Zoöl.-Congr., Berlin, p. 1142: Bukoba, Tanganyika Territory.

Skin (M. C. Z. 26878) Dabaga, Uzungwe Mtns. 3. i. 30.

Native name. Tondolega (Kihehe).

Discussion. A skin, purchased from the natives, represents this species and is identical in coloring with examples from Kenya. German settlers at Dabaga confirmed the occurrence of genets there.

Nandinia binotata arborea Heller

Nandinia binotata arborea Heller, 1913, Smithsonian Misc. Contr., **61**, no. 13, p. 9: Lukosa River, northeast of Kisumu, Kenya Colony.

1 (M. C. Z. 27148) Madehani, Ukinga Mtns. ii. 30.
1 (M. C. Z. 26550) Nkuka Forest, Rungwe Mtn. iv. 30.

Native names. *Imbukula* (Kikinga & Kinyakusa); *imbuli* (Kinyika).

Discussion. These two native-made skins indicate the presence of this tree-civet in the mountains of southwestern Tanganyika Territory. The Madehani skin has been remade from a bag; the vendor of the Rungwe specimen assured Loveridge that it had been taken in the Nkuka Forest.

In their reddish dorsal coloring, unspotted bellies and narrow-ringed tails they agree with Heller's description of the eastern form, but a comparison with Cameroon skins shows that the range of color variation is considerable and that the color characters are hardly diagnostic.

Myonax grantii (Gray)

Calogale grantii Gray, 1864, Proc. Zoöl. Soc. London, p. 561: Tanganyika Territory. "Mgunda Mkali[1]."

♀ (M. C. Z. 26546) Kigogo, Uzungwe Mtns. 14. i. 30.

Native name. *Lukwiru* (Kihehe).

Discussion. This beautiful mongoose seems to be uncommon in collections. Its nearly uniform bright-ochraceous coloring with a deep-chestnut tail-tip render it a striking species. The skull measures: greatest length 68 mm.; basal length 64 mm.; palatal length 35 mm.; zygomatic width 32.3 mm.; mastoid width 24 mm.; width outside molars 21.5 mm.; upper tooth row 28 mm.; lower tooth row 28 mm. The skull differs in minor details from that of the specimen I identify as *proteus*, having slightly broader upper molars, longer ear bullae and pterygoids.

Measurements. ♀ 325. 285. 60. 25 mm.

Parasites. Nematodes (*Dujardinia* sp.) were numerous in its stomach.

Habits. This mongoose was one of three which ran across a path through dense undergrowth, then paused to look back at me. I approached the copse silently, then heard the others calling to it with a whistling cry; presently one scolded close by in the tangled cover, I moved slightly and it sprang back having come to within ten feet of me.

[1] *Mgunda* is a Kiswahili substantive for cultivated lands, *mkali* the adjective for fierce. It would seem more probable that this is an incorrectly transcribed name for the animal rather than the type locality.

Myonax sanguineus proteus (Thomas)

Mungos gracilis proteus Thomas, 1907, Ann. Mag. Nat. Hist. (7), **19**, p. 119: Ruwenzori East. Thomas & Wroughton, 1910, Trans. Zoöl. Soc. London, **19**, p. 496, pl. 21.

1 (M. C. Z. 26879) Dabaga, Uzungwe Mtns. 3. i. 30.
1 (M. C. Z. 26540) Igale, Poroto Mtns. 26. iv. 30.

Native name. Kihindi (Kihehe, according to the vendor of the Dabaga skin).

Discussion. These two specimens are provisionally referred to the race *proteus*, first described from Mt. Ruwenzori. The Dabaga specimen, in the normal pelage, agrees closely with the colored figure of Thomas & Wroughton's plate in its rich rufous-ochraceous coloring and clear bright rufous feet. This is a native skin without a skull, purchased from natives. The second specimen is melanistic, blackish brown all over minutely ticked above with paler. The two phases are shown in the colored plate referred to above.

Measurements. The Igale ♂ measured 320. 275. 60. 20 mm.

Diet. There were small cockchafers in its stomach.

Parasites. A tapeworm and species of nematode were present in its viscera.

Herpestes ichneumon funestus (Osgood)

Mungos ichneumon funestus Osgood, 1910, Publ. Field Mus. Nat. Hist., zoöl. ser., **10**, no. 3, p. 17: Naivasha, Kenya Colony.

1 (M. C. Z. 27317) Madehani, Ukinga Mtns. ii. 30.

Native name. Nyeretzi (Kikinga).

Discussion. A flat skin remade from an entire skin which had been used as a bag, purchased from a native who stated that the mongoose had been killed in Madehani village.

Atilax paludinosus rubescens (Hollister)

Mungos paludinosus rubescens Hollister, 1912, Proc. Biol. Soc. Washington, **25**, p. 1: Kilimanjaro, Tanganyika Territory.

♀ (M. C. Z. 26458) Mwaya, Lake Nyasa. 3. iii. 30.

Native name. Mkekwa (Kinyakusa).

Discussion. This single specimen of the marsh mongoose is smaller in skull measurements than any of those listed by Hollister, although

it is fully adult and sexed (perhaps wrongly) as a male. With a condylobasal length of 96 mm., it is much smaller than *A. p. mordax* from northwest of Lake Nyasa in which this measurement is 115 mm.; in *A. macrodon* of the Upper Congo Basin it is 108.8 mm. It may perhaps best be considered as representing *rubescens*.

Measurements. Alleged a "male" measuring 460. 320. 90 (with claws 95). 35 mm.

Enemies. Said to have been killed by a dog; this animal appeared to be in a somewhat diseased condition.

Ichneumia albicauda grandis (Thomas)

Herpestes grandis Thomas, 1889, Proc. Zoöl. Soc. London, p. 622: ? Limpopo or Zululand.

5 (M. C. Z. 26554–5, 27145–7) Ukerewe Id., Lake Victoria. 12–19. vi. 30:

Discussion. These five adults agree in their strikingly large size as compared with *I. a. ibcana* which at first they were taken to be. None of the series from Kenya Colony equals them in this respect, and I have no doubt, on account of the close coincidence of their measurements, that they represent Thomas's *Herpestes grandis*. This was based on a skeleton of a large White-tailed Mongoose, the exact origin of which was unknown, though it was believed to have been collected by T. E. Buckley either on the Limpopo or in Zululand, South Africa. I have found nothing further concerning this animal since its original description, so that the following notes may be acceptable. The color of the body is the same mixed gray and black seen in *I. albicauda ibcana* with a considerable admixture of black in the median area from nose to base of tail. The lower part of the legs, fore and hind, and the feet are uniform brownish black. The tail seems to be much less white than in the usual type of *albicauda*, only the terminal quarter being clear white, the basal three-quarters mixed black and white, most of its hairs having a long white base, followed by a black ring nearly as long, then a shorter white tip. The skulls are all longer than the maximum listed by Hollister in his table, but the supposed differential character mentioned by Thomas of a distinct metaconid on the last lower molar does not seem to hold; it may be present too in little-worn teeth of *H. albicauda ibeana*. The distinction, therefore, rests chiefly on size, but this is so very striking that *grandis* may be regarded as valid, though doubtless only in a subspecific sense.

Measurements. The field measurements are as follows:

Register no.	Head & body	Tail	Hind foot	Ear	Sex
26554	660 mm.	440 mm.	120 mm.	40 mm.	♀
26555	615 mm.	425 mm.	130 mm.	40 mm.	♂
27145	603 mm.	460 mm.	120 mm.	40 mm.	♂
27146	590 mm.	460 mm.	120 mm.	40 mm.	♂
27147	590 mm.	460 mm.	120 mm.	40 mm.	♂

The skull measurements follow, as well as those of the largest of the thirteen specimens listed by Hollister from Kenya Colony.

Register Number	Greatest length	Basal length	Palatal length	Zygomatic width	Upper cheek teeth	Lower cheek teeth
26554	—	—	65 mm.	—	43 mm.	48 mm.
26555	116 mm.	110 mm.	68 mm.	62 mm.	45 mm.	50 mm.
27145	112 mm.	106 mm.	66 mm.	58.5 mm.	43 mm.	48.5 mm.
27146	114 mm.	109 mm.	67 mm.	60 mm.	44.6 mm.	49 mm.
27147	115 mm.	109.5 mm.	68.5 mm.	61 mm.	45 mm.	49 mm.
U. S. N. M. *Ichneumia albicauda ibeana* (Hollister's largest).						
182346	110 mm.	—	—	56 mm.	43 mm.	47.8 mm

Diet. Grasshoppers and termites were present in the stomachs of three of the mongooses.

Parasites. Ticks (*Haemaphysalis leachii* and *Rhipicephalus* sp.) were present in their fur, tapeworms in their stomachs and linguatulids in the liver.

Habitat. All five were shot at night, mostly between 1 and 2 a.m. as they came trailing a meat bait which had been dragged for a mile along a path through the bush.

Ichneumia albicauda ibeana (Thomas)

H(erpestes) a(lbicaudus) ibeanus Thomas, 1904, Ann. Mag. Nat. Hist. (7), **13**, p. 409: Athi-ya-Maui (i. e. Stony Athi Station), Kenya-Uganda Railway, Kenya Colony.

♀ (M. C. Z. 25836) Unyanganyi, Turu. 4. xii. 29.

Native names. Saka (Kinyaturu); *kananga* (Kikami).

Discussion. This identification is made with reserve as the mongoose is only half-grown and so unidentifiable by subspecific characters. This form is, however, known to occur a little to the east of Unyanganyi, and there seems to be no reason to doubt its identity with *ibeana*.

Measurements. ♀ 378. 290. 93. 35 mm.

Diet. Some insects, taken from its stomach, were preserved.

Helogale victorina Thomas

Helogale victorina Thomas, 1902, Proc. Zoöl. Soc. London, p. 120: Nassa, Speke Gulf, Victoria Nyanza, Tanganyika Territory.

♀ (M. C. Z. 26531) Kikuyu, Ugogo. 23. xii. 29.

Native name. *Sala* (Chigogo).

Discussion. This single specimen from Kikuyu on the outskirts of Dodoma is similar to others from Tanganyika in the collection of the Museum of Comparative Zoölogy.

Measurements. ♀ 240. 120. 45. 20 mm.

Mungos mungo colonus (Heller)

Crossarchus fasciatus colonus Heller, 1911, Smithsonian Misc. Coll., **56**, No. 17, p. 16: Southern Guaso Nyiro, Kenya Colony.

♂ (M. C. Z. 26530) Mwanza, Lake Victoria. 7. vi. 30.
3 (M. C. Z. 26526–8) Ukerewe Id., Lake Victoria. 12. vi. 30.

Native name. *Nkala* (Kisukuma).

Discussion. These specimens agree in their gray shoulders with Heller's description, and have shorter tails than the race *macrurus* of Ruwenzori. There is more or less variation of an individual nature in the amount of rusty color of the paler transverse bands.

Measurements. Two juvenile males from Mwanza and Ukerewe measure 210. 130. 50. 20 mm. and 240. 145. 55. 15 mm.

Breeding. In addition to the young males mentioned above three still smaller animals were brought to me alive on the twelfth and thirteenth; these represented two litters and show that May or early June is apparently the breeding season in this region.

Parasites. *Porocephalus* was present in the liver of an adult.

Habits. Though the three young alluded to above were from different litters, one animal being much smaller than the other two, yet one of the larger, from the very first, dissociated itself from its companions and exhibited an astonishing preference for human society. This threw the two weaker animals together and they were bullied by the friendly one whom we can call A. It was customary for A to snap at B and C and drive them from the dish of food until he had fed to repletion; also if anyone attempted to stroke B or C when A was in the vicinity, he would hurl himself upon them viciously. If the lid of their large and roomy cage was raised, A would leap and squeak or chirp, for he loved to be taken up and petted, his ears and

armpits rubbed, or his fur stroked forwards or backwards. He might be rolled on his back, pulled about by the tail or dragged along by a leg; no indignity could surprise him into an exhibition of bad temper.

A fortnight after receiving them I was camping at Entebbe and allowed them to roam at large — the sliding front door of their cage was propped up so that they could run back into it if alarmed. At Jinja also, they were allowed freedom for several hours a day, but one could not handle B and C for they would utter an explosive note and spring forward with a snap; one good bite upon my finger tip taught me caution and instead of lifting them back into their cage, they were shepherded home when it was desirable to fasten them up for the night. Then followed a week of travelling when they could not be allowed out. On board ship their cage was placed on the forward hatch (shaded when necessary) and A was permitted to roam at large daily. At first the cage was often surrounded by passengers whose sudden movements were at times a source of great alarm to B and C. There were, however, three boys on board who helped tremendously by playing with the mongooses for hours at a time. After four days at sea, C was gingerly lifted out and raced about in enjoyment of this freedom till she was scared by the wind blowing a hat along the deck and fled off the hatchway. I was fetched and after a little manoeuvering succeeded in retrieving her. On the morning of the eighth day at sea I lifted out the tame animals, but when B was approached he snapped as usual and after two attempts I desisted. Later in the day I returned and sitting beside the cage attempted to rub his ears. To my astonishment he crouched down and though evidently in great alarm, he submitted. After petting him for several minutes I quietly lifted him out of the cage and set him down outside. This was almost the last time that I had any trouble with him. The trio raced about the hatchway, stretched out in the sun, rolled over, biting each other in play; two coils of wire hawser were selected by them as their headquarters and refuge from both friends and fancied foes. In due course they arrived at their destination and were presented to the Zoölogical Society of London.

HYAENIDAE

Crocuta crocuta germinans (Matschie)

Hyaena (*Crocotta*) *germinans* Matschie, 1900, Sitzber. Ges. naturf. Freunde Berlin, p. 27: Lake Rukwa, Tanganyika Territory.

Folklore. An old Mnyakusa at Ilolo related to me the following rather foolish story of the hyena: A hyena said to his friend, "Wait a

moment and let me precede you, then look well and tell me if my figure is all right." His friend laughingly exclaimed, "No, very bad." Then the friend went ahead and the first hyena laughed at his appearance in the same way; in this manner they continued their nocturnal prowl, each in turn laughing at his companion's build and gait.

FELIDAE

Acinonyx jubatus ngorongorensis Hilzheimer

Acinonyx guttatus ngorongorensis Hilzheimer, 1913, Sitzber. Ges. naturf. Freunde Berlin, p. 290: Ngorongoro, Tanganyika Territory.

1 (M. C. Z. 26467) Ipemi, Uzungwe Mtns. 7. i. 30.

Native name. Dhambanyika (Kihehe).

Discussion. In his discussion of the East African cheetahs, Hollister indicates slight differences that may be constant between those of northern and central Kenya and Tanganyika. It is still a question how far one may go in recognizing geographical races, for the material available for comparison is hardly representative enough. The fine specimen from the Uzungwe region agrees, however, with Hilzheimer's description of *ngorongorensis* in its pinkish buff sides and belly, lacking white below. Compared with a skin from Asia Minor in which the belly is part white, the black spots are much more numerous and larger. Since Hilzheimer's name has slight priority over Heller's *raineyi* and *velox* for the cheetahs of Kenya, I am using it in preference, especially since the description, though based on a menagerie specimen, seems to agree rather with our animal in the replacement of white by buffy below.

Felis pardus suahelica Neumann[1]

Felis leopardus suahelicus Neumann, 1900, Zoöl. Jahrb. Syst., **13**, p. 551: "East Africa," specimens mentioned from Tanga, etc.

Diet, etc. Colobus (*Colobus polykomos sharpei*) and Mountain Duiker (*Cephalophus melanorheus lugens*) were found in the excrementa of leopards in the Nkuka Forest on Rungwe as was Blue Monkey (*Cercopithecus leucampyx moloneyi*); in addition intestines of this monkey were found in Ngosi Crater where this leopard abounds.

[1] Pocock (Proc. Zool. Soc. London, 1932, p. 558) has recently advocated that the name of this leopard should be *Panthera pardus fusca* (Meyer), since he is unable to distinguish it from the Indian race. Nevertheless, since the typical race *pardus pardus* intervenes between the range of the East African and the Indian forms, we prefer for the present to retain the name *suahelica* for the former, and to regard *Panthera* as a subgenus of *Felis*.

While I was camped on Rungwe a leopard carried off a suckling pig from the near-by Rungwe Mission, three miles below my camp in the forest. The pig was found lodged in the branches of a tree at a height of about twenty feet from the ground. Gun traps were set at the foot of the tree but the leopard ascended without disturbing the strings; in descending with the pig, however, it fired a gun which shattered the leopard's right forefoot. Later the leopard was located in a small hill close to the mission buildings; thither three of the staff went, Mr. Scharff armed only with a revolver. Without warning the leopard sprang upon him from quite short grass and, seizing his right arm above the elbow in its jaws, bore him to the ground by the suddenness of the impact, at the same time it prevented his making use of the revolver; the animal started to claw him and he rolled over to protect his face. Fortunately he was wearing a thick coat at the time which saved him but he received some quite unpleasant wounds nevertheless. Leaving him, the leopard attacked four natives in quick succession before it was killed by a shot from Mr. Staub's rifle. Mr. Scharff related the incident to me several days after it occurred.

On arrival at Njombe the District Officer — Mr. J. E. Seymour — related the following incident which, at my request, he was kind enough to write down for me. I was shown the claw marks of the leopard on the door of a cupboard in his lounge. Mr. Seymour's account follows: "We were just going to have dinner when our big dog (about the size of an ordinary foxhound) came into the room covered with blood and water. We presumed that he had gone to drink at the furrow and a leopard had attacked him. They had probably fallen into the water and the leopard had taken fright. The dog was in a pretty bad way but my wife bandaged him up. The next night when we went to bed we left the dog asleep in our lounge before a roaring fire which must have burnt all night. The front door was shut but the back door was open. During the night the leopard came in and seized the dog. Claw marks can still be seen on the tiled floor. The next morning we saw the tracks of the leopard leading to the thick bush near the river. During the day the spoor was followed and the remains of the dog were found. These were poisoned and though the leopard had another go at the carcass the next night it appears he got rid of the poison. The next night he again returned to the house where he clawed the meat safes on the back verandah and also tried to get into the kitchen where another dog had been locked up for safety. Though several gun traps were set the leopard was never caught." I might add that the kitchen door was clawed to a height of six feet.

Felis capensis hindei Wroughton

Felis capensis hindei Wroughton, 1910, Ann. Mag. Nat. Hist. (8), **5**, p. 205: Machakos, Kenya Colony.

♂ (M. C. Z. 25738) Saranda, Ugogo. 30. xi. 29.

Distribution. Native skins were also offered for sale at Dabaga, Madehani and Ilolo.

Native names. Nulua (Kihehe); *nyombe* (Kikinga); *injusi* (Kinyakusa).

Measurements. ♂ 850. 320. 95. 110 mm.

Diet. Mouse fur present in stomach but the animal decidedly emaciated.

Parasites. An enormous number of fleas (*Ctenocephalus felis* and *C. connautus*), a few ticks (*Rhipicephalus appendiculatus*), sixteen hippoboscid flies (*Hippobosca capensis*) were captured, while as many again escaped. Between the skin and the shoulders was a mass of tapeworms which Dr. J. H. Sandground informs us are a pseudophyllidean type and, to the best of his belief, constitute the first record of proliferating *Spharganum* larvae in Africa. He considers it probable that the animal contracted this infection through eating frogs or fish infested with an earlier larval stage of *Spharganum*. An Acanthocephalid and numerous other nematodes (*Toxocara mystax, Physaloptera praeputiale,* and *Prosthenorchis pardalis*) were present in the stomach.

Remarks. The encounter with this animal was so unusual that it seems worth recording. Accompanied by a native I had been following a baboon trail on which were cat tracks, down through the thickets which clothe the escarpment. On emerging from the undergrowth we saw many baboons which made off rather more slowly than usual but perhaps this was because I carried no firearms. They barked defiance as we came scrambling down the rocks. I halted for a moment to appreciate the scenery when my attendant exclaimed: "Look at that leopard," as he pointed to a tree thirty feet below upon whose base a serval crouched. On seeing us it slipped off and walked away, down the ravine, till it disappeared round a bend fifty yards away. We watched it in astonishment, my companion suggesting that it had been attacked by baboons, hence its inability to travel at a serval's customary speed. We followed, little expecting to see it again, but on rounding a rock, came suddenly upon it. The animal rose with a snarl and climbing ten feet farther up the side of the ravine collapsed beneath a bush. I climbed to within ten feet of it, then approached

within six. Having no gun I threw three stones: the first two cleared the bush but missed the serval which only snarled in response; the third struck it full on the forehead and stunned it, a blow from a stick finished it. There were no signs of its having been attacked by the baboons and I concluded that it had succumbed to heavy infestation by parasites which, perhaps, it might have been able to overcome but for the drought.

GALAGIDAE

Galago crassicaudatus argentatus Lönnberg

Galago argentatus Lönnberg, 1913, Ann. Mag. Nat. Hist. (8), **11**, p. 167: Ukina, near Shirati, Tanganyika Territory.

♂ (M. C. Z. 26877) Ukerewe Id., Lake Victoria. 16. vi. 30.

Native name. *Mulilalila* (Kikerewe).

Discussion. In Schwarz's (1931) review of *Galago*, this is recognized as a valid race of *G. crassicaudatus*, distinguished by its beautiful silvery gray pelage. He has also mentioned its occurrence on Ukerewe Island.

A second form, characterized by entirely black pelage, occurs upon the island and is probably but a melanistic phase of *argentatus;* though of distinctive appearance the natives do not distinguish it by a separate name.

Measurements. ♂ 320. 375. 55. 60 mm.

Habits. These galagos are extremely abundant in the dense thickets or bush which cover parts of the island. Even for galagos they are exceptionally noisy on moonlight nights; though they cry at sunrise and sunset they are fairly quiet till the moon is up, thereafter their strange cries "haahaa, wuurrk" and throaty growling resound on every side.

Galago senegalensis moholi Smith

Galago moholi A. Smith, 1839, Illus. Zoöl. S. Africa, **1**, pl. lxxxviii bis: South Africa.

4 (M. C. Z. 26446, 26449–51) Madehani, Ukinga Mtns. 14–17. ii. 30.

Native name. Quite unknown to the natives of Madehani.

Discussion. Comparison of this small series with a specimen representing the South African *G. s. moholi*, shows no important difference, and Schwarz is doubtless correct in referring to this race the small

South African galagos from Tabora, Tanganyika Territory, southward. The series from the Uluguru Mountains that we previously identified doubtfully with *cocos*, are scarcely distinguishable and are perhaps nearer *G. s. braccatus*.

Measurements. The largest ♂ measured 140. 165. 50. 35 mm.; the largest ♀ 150. 190. 55. 35 mm.

Breeding. None of the specimens was in breeding condition.

Habits. One evening I heard the call of a galago within fifty yards of my tent; hurrying to the spot I caught a glimpse of two scurrying forms, one in a cypress, the other in a eucalypt, running to the forest. The following evening I posted myself at the spot just before dark and after a wait of ten minutes again heard the cry which immediately preceded the arrival of a galago which desired to cross from the tip of one branch to that of another in an adjacent tree. About ten appeared, of which I shot three, the rest going on into the forest. On the evening of the fifteenth and again on the sixteenth, I posted natives to watch from whence these galagos came. In this way we tracked three back to a mass of vegetation in a big tree not far from the forest edge. Next morning Salimu climbed to what was apparently a "nest" but only one galago came out. The "nest" was a natural assemblage of dead and decaying leaves into which the galago had burrowed. That evening I again watched with several natives at 6.20 p.m. (still daylight), the time when they usually appeared. None was detected, however, either because we had just had a heavy downpour which had left all the foliage dripping, or else because our attentions had scared them from the vicinity.

CERCOPITHECIDAE

Cercopithecus leucampyx moloneyi Sclater

Cercopithecus moloneyi Sclater, 1893, Proc. Zoöl. Soc. London, p. 252, pl. 17: Karonga, Nyasaland.

♂ ♀ ♀ (M. C. Z. 26547, 26831–2) Kigogo, Uzungwe Mtns. 14–27. i. 30.
♂ (M. C. Z. 26829) Madehani, Ukinga Mtns. 18. ii. 30.
Skull & ♂ ♂ (M. C. Z. 27316, 26830, 27174) Nkuka Forest, Rungwe Mtn. 28. iii. 30.

Native names. Dumbili (Kihehe); *neri* (Kikinga); *indoweka* (Kinyakusa); *munzu* (Kimahausi).

Discussion. The type of *moloneyi* came from Karonga, at the northwest end of Lake Nyasa, so that the specimens from Madehani and

Rungwe are nearly topotypical. The Uzungwe series is quite the same. Sclater's excellent figure, reproduced in Elliot's Review of the Primates, **2**, pl. 6, shows the color characters very well.

Measurements. The largest ♂ (Madehani) measured 640. 820. 110. 40 mm.; largest ♀ (Kigogo) measured 555. 680. 130. 35 mm., and the young ♀ 255. 275. 82. 35 mm.

Breeding. The adult female shot at Kigogo on January 14 was nursing the young one.

Diet. At Kigogo these monkeys were disturbed when feeding upon the bamboos; the ground round about was littered with the broken and chewed fragments.

Parasites. Nematodes (*Oesophagostomum pachycephalum* and *Streptopharagus intermedius*) were both present in monkeys from the Nkuka Forest, the former only in the Kigogo monkeys.

Enemies. A Martial Hawk-Eagle (*Stephanoaëtus coronatus*), shot at Kigogo, held the bones of one of these monkeys in its stomach. In the crater of Ngosi Volcano we found the remains of a Moloney's Monkey with the intestines intact, evidently a recent leopard-kill. While we were examining it at 2 p.m., both blue monkey and colobus were barking or grunting away to our left, disturbed either by a leopard or eagle to judge by the uproar. Finger nails and fur were found in the excrement of a leopard in the Nkuka Forest, where these monkeys are much sought after by the Banyakusa who eat the meat.

Habitat. While I was sitting motionless in the Nkuka Forest one evening as night was falling, a large party of monkeys led by an old male, came into the surrounding trees and even right above my head. The trees were of small size, but one was rather larger than the rest and had been selected apparently as the resting place by the leader who "barked" loudly. The small monkeys arrived and passed into the surrounding trees in which they kept up a bird-like twittering; it was quite dark when I left them and they were still moving about and uttering cries of one kind or another. It seemed strange that they should be so noisy at such a time, advertising their resting place to any leopard that might be on the prowl.

Cercopithecus aethiops centralis Neumann

Cercopithecus centralis Neumann, 1900, Zoöl. Jahrb. Syst., **13**, p. 533: Bukoba, west shore of Victoria Nyanza, Tanganyika Territory.

♀ (M. C. Z. 26481) Ukerewe Id., Lake Victoria. 18. vi. 30.

Native name. Enkende (Kikerewe).

Discussion. This skin and skull of an adult female are apparently quite typical.

Measurements. ♀ 460. 510. 110. 20 mm.

Papio ? neumanni Matschie

Papio neumanni Matschie, 1897, Sitzber. Ges. naturf. Freunde Berlin, p. 181: Donyo Ngai, Tanganyika Territory.

♂ ♀ (M. C. Z. 26472–3) Ukerewe Id., Lake Victoria. 10 & 16. vi. 30.

Native name. Enkobe (Kikerewe).

Discussion. Two skins and skulls of immature animals from Ukerewe Island are presumably of this form, though it must be said that the distinction of the various named varieties of baboons from eastern Africa is still unsatisfactory. The skins show a greater proportion of tawny than of black in the pelage, the tails are untufted and somewhat grayer than the body. The hands and feet of one are deep black, with a few small, partly hidden tawny marks; of the other a nearly uniform mixture of tawny and black like the body.

Measurements. The ♂ measured 530. 380. 165. 60 mm.

Parasites. Many nematodes (*Physaloptera caucasia*) were present in the stomach of the male.

COLOBIDAE

Colobus polykomos sharpei Thomas

Colobus sharpei Thomas, 1902, Proc. Zoöl. Soc. London, p. 118: Fort Hill, Nyasaland.

Colobus polykomos sharpei Schwarz, 1929, Proc. Zoöl. Soc. London, p. 597.

♂ ♀ (M. C. Z. 26828, 27175) Fungwe Forest near Madehani, Ukinga Mtns. 17. ii. 30.

Distribution. Elsewhere this species was reported as present in the New Forest Reserve at Dabaga, and seen within and without the Ngosi Volcano Crater and in the Nkuka Forest, Rungwe Mountain. where guerezas are more abundant than in any other place visited by the collector.

Native names. Imbega (Kihehe, Kikinga and Kinyakusa).

Discussion. The type locality, Fort Hill, is near the northwest end of Lake Nyasa, hence the pair of colobus from near Madehani should represent this race which, however, is very close to *palliatus* (whose

type locality is the coast opposite Zanzibar) differing only in larger size and in certain correlated skull characters.

Enemies. In the Fungwe Forest, three hours south of Madehani and near the northeast shores of Lake Nyasa, these guerezas are as shy as at Madehani; it took two hours of scrambling up and down very steep forest-clad hillsides before this pair was obtained. Half a dozen colobus skins were brought to the camps at Madehani, Nyamwanga and Rungwe and offered for sale; these were refused and the vendors professed entire ignorance of any contravention of game regulations in killing the animals. Doubtless they were primarily killed for food as the Wahehe, Wakinga and Banyakusa all eat colobus. The Wahehe make ingenious bag nets which are placed on the larger limbs of the tree — facing the trunk — in which the guerezas are sleeping. The animals sleeping in the top of the tree are then scared and as they run out along the limbs of the tree they are enveloped in the bags (which can be set one behind the other) and each bag drops from the branch, but remains attached by the cord which simultaneously closes the aperture; this results in the animal being suspended in the air, uninjured but imprisoned in the bag. The Banyakusa have a different method, they fell the trees adjacent to the one in which the guerezas are sleeping, then ascend the tree cutting off the branches as they go until the scared animals are at their mercy.

Colobus fur was found in the excrement of a leopard in the Nkuka Forest.

In this same forest a Martial Hawk-Eagle (*Stephanoaëtus coronatus*) was shot while engaged in eating a colobus; a second eagle flew away. Salimu, who shot the bird, brought back a hind leg of the colobus, a fully adult animal, which was in the talons of the eagle. A great many small maggots were present in what appeared to be talon marks on the limb, I should say that at least forty-eight hours had elapsed since the animal had been killed; it is obvious, however, that an eagle could not devour so large a monkey in one meal and would naturally return to the kill again and again.

One frequently hears a rippling cry of "cooe-cooe" oft repeated in the forest and while I declared it was made by a hawk, Salimu affirmed that it was a preliminary call of a colobus for it usually terminated with their hoarse, throaty growl; on one occasion he had stalked a tree from which the cry had come and found only an old colobus in it. Shortly after this argument, however, Salimu came upon an eagle in a tree actually giving the call of "cooe-cooe." He was manoeuvering for a shot when a big male colobus, uttering its harsh warning cry, rushed

up the tree to the eagle which flew off to an adjoining tree actually pursued by the colobus which caused it to take to wing again. Salimu said that the rest of the company of colobus were all crouching among the leafage on the big limbs of the first tree and so occupied in looking upwards that they failed to observe him below.

Habits. How persistently a colobus may remain concealed was well illustrated on another occasion when we were endeavouring to smoke, or drive, an alleged flying squirrel from the hollow trunk of a two-hundred-foot tall tree. After cutting and breaking down the saplings surrounding the tree, we spent half an hour in trying to light a smoky fire and in hammering on the tree-trunk. After this noisy period there followed a silence which appeared to be more trying to the guereza than the noise for to our great surprise, as we had not suspected its presence, it sprang from the tree.

These colobi are tamer in the Nkuka Forest than in any other place known to me. One afternoon a guereza returned to within sixty feet of me three times to take another look; evidently fearful, its curiosity overcame its fear. The interesting thing about the incident was the noise which it made as it departed, a noise which I had never before heard from a colobus; it was an explosive, sneeze-like sound which I can only compare to a noise frequently made by goats.

After spending the morning in feeding and wandering through the forest these guerezas often rest at noonday. On April 14 I was following a path up the mountain at 1 p.m. when I observed two guerezas taking a siesta in a tree on my left so that the animals were only sixty feet from me and quite unaware of my presence; this induced me to sit down and watch them. Presently a few drops of rain fell and one of the guerezas awaking, stretched out its left leg and scratched the left buttock very vigorously. I had not found any ectoparasites on any of the colobus collected, in fact Rungwe Mountain seemed to be too wet for fleas for not one was found on any mammal in this forest, despite the long series of squirrels secured. Having relieved the irritation to its satisfaction the colobus bent forward and commenced a minute inspection of the toes of its left foot, employing both hands to separate them; while engaged in this manner it leaned still farther forward and so caught sight of me from between its legs. With a single bound it landed in the next tree and running along a branch was soon lost to sight. Its companion, thus suddenly aroused from slumber, raised its head which had fallen forward upon its chest. For many seconds it made no further move, then suddenly bounded off in the same manner as the first.

Colobus badius gordonorum (Matschie)

Piliocolobus gordonorum Matschie, 1900, Sitzber. Ges. naturf. Freunde Berlin, p. 186: Uzungwe (Udschungwe) Mtns, Tanganyika Territory.
Colobus badius gordonorum Schwarz, 1928, Zeitschr. f. Säugetierk., **3**, p. 95.

4 (M. C. Z. 2655–3, 26736) Dabaga, Uzungwe Mtns. 30. xii. 29.

Native names. *Nguluwa* or *kulula* (Kihehe).

Discussion. Two adult females and two youngish specimens were obtained at Dabaga in the Uzungwe range of southwestern Tanganyika to which this strikingly handsome form seems to be confined.

Matschie described this monkey as a distinct species in 1900 on the basis of an imperfect skin found in a native hut, and two other skins secured in the same region by the brothers von Gordon, for whom it is named. So local is this race that apparently no others had reached Europe when Elliot, in 1912, published his Review of the Primates; nor was it until 1923 that another specimen was recorded, when the first to be received by the British Museum was sent by Loveridge. Of this specimen Kershaw (1923) writes that the entire back from shoulders to tail is mostly red, but the skin is much worn. One of the adult females secured by Loveridge has the top of the head rufous bordered narrowly at the sides by black, and the entire back is deep shiny black with almost no admixture of red hairs even at the base of the tail. The fore limbs are black, the hind limbs black mixed with silvery. The tail is mixed black and ochraceous. The lower surfaces are white.

The skulls measure: greatest length 108.5, 105 mm.; condylobasal length 86.5, 85 mm.; palatal length 41, 41 mm.; zygomatic width 80, 76 mm.; width of palate outside molars 33, 34 mm.; width of brain case 61.5, 57 mm.; outside orbits 64.5, 61 mm.; maxillary tooth row (c–m^3) 35; mandibular tooth row (c–m_3), 38.

Of the two young, one is rather small, but both are coloured like the adult except that the tails show a variable amount of black.

The nearest relative of this handsome monkey is believed to be *C. kirki* of Zanzibar, and although regarded (and no doubt rightly) by Schwarz as merely a subspecies of *C. badius*, its present isolated position and striking color pattern seem to set it off well from others of the genus. Probably at some former time its distribution was more extended.

Measurements. The adult females measured 655. 685. 180. 35 mm. and 600. 640. 170. 35 mm., and a nursling male 170. 320. 100. 30 mm.

Breeding. Both adult females were nursing young when shot; it was impossible to see this at the time, as they were shot on the run.

Parasites. Nematodes (*Streptopharagus intermedius*) were recovered from the stomachs of these guerezas.

Enemies. The bodies were eaten by Wahehe porters.

Habitat. The forest where these animals were killed lay about three miles east or southeast of my camp and at an altitude of 5,000 feet. It was almost dusk when we came up with the troop and had to shoot the animals on the run and at a great height.

ANOMALURIDAE

?ANOMALURUS ORIENTALIS Peters

Anomalurus orientalis Peters, 1880, Monatsber. Akad. Wiss. Berlin, **45**, p. 164: "Zanzibar" probably Nguru Mtns., Tanganyika Territory.

Distribution. Shortly after my arrival in the Nkuka Forest on Rungwe Mountain, I learned that Mr. Scharff, one of the mission staff, had seen a flying squirrel in 1927, when the forest was being inspected with a view to cutting timber. During the twenty-six days of our stay I made repeated inquiries from natives as to the existence of such a creature, but it was not till the end of the third week that I met a man — a Mnyika — who declared that he had twice seen one of these animals during a lifetime spent in the forest. He completed the description quite accurately and added that he had never met anyone before who knew anything about the creature, even its name being unknown to him. From the description furnished by this man as well as by Mr. Scharff, it would appear that the flying squirrel of Rungwe Mountain is identical with, or closely related to, *A. orientalis* of the coastal mountains Uluguru, Nguru and Usambara.

That the animal is extremely rare is obvious for we made it the main object of our search during the best part of a week. At the base of a hollow tree of enormous dimensions — perhaps two hundred feet in height — and covered with parasitic growths, Salimu found some excrement which very possibly came from a flying squirrel. Both the tree and its situation, which was on the summit of a spur of the mountain, seemed just such as a flying squirrel would have chosen in the Uluguru Mountains; on the other hand the droppings may have been those of a red squirrel (*Acthosciurus lucifer*) for on two occasions one was disturbed in an adjacent tree. Whether the red squirrel lives in hollow trees instead of in a nest among the branches I cannot say, as no nests were seen in the forest during our stay; one would suspect that they build in hollow trees because of the continuous downpour.

SCIURIDAE

Heliosciurus undulatus rhodesiae (Wroughton)

Funisciurus annulatus rhodesiae Wroughton, 1907, Mem. Lit. and Phil. Soc. Manchester, **51**, pt. 2, art. 5, p. 15: Ndola, Northern Rhodesia.

♀ (M. C. Z. 26544) Kitungulu, Urungu. 15. v. 30.

Native name. Kapali (Kirungu).

Discussion. A single adult female from Kitungulu, near the southeast end of Lake Tanganyika, unquestionably represents *rhodesiae* and constitutes its most northeastern record. The exact relationships of this squirrel seem still uncertain. Major Ingoldby has recently advocated its close affinity to the small *gambianus* group of the western forest, listing it, however, as a distinct species, but these, although similar in pattern, seem to be smaller forms, and the thumb has its claw narrow and compressed, more like a functional claw, in contrast to the flattened nail-like claw on the thumb of *rhodesiae* and other East African Heliosciuri. Indeed, it appears to be much nearer *H. undulatus*, agreeing in the relatively long narrow tail with annulations, the shortened ear, and generally coarse ticking of its hair-pattern. The prominent short white lines, one above and one below the eye, are in *undulatus* of a deep ochraceous, and the clear white of the lower surface of the body and limbs is replaced in *undulatus* by a light rusty wash. Otherwise, however, and except for the slightly smaller size of *rhodesiae*, the two seem very similar, so that I have ventured to associate the latter with *undulatus* as a subspecies.

The skull of this specimen measures: greatest length 50 (48) mm.; basilar length 38 (36); palatal length 23; zygomatic width 29 (27) mm.; interorbital width 15 (14) mm.; upper molar row 10 (9) mm.; lower molar row 9.8 mm.; length of bulla 11.5 (11) mm. The measurements in parenthesis are those given for the type of *rhodesiae*. Those of our specimen are slightly larger, as was to be expected from the fact that the locality is intermediate between the area whence the type came, and the Kilimanjaro region where *undulatus* is typical.

A skin without a skull purchased from a native at Dabaga, Uzungwe Mountains, where the species is known as *kihindi* to the Wahehe, is perhaps an intermediate between *rhodesiae* and typical *undulatus*, with its undersurface light yellowish brown and the hind feet grizzled gray like the back, instead of rusty. As no living examples were seen at Dabaga it may be uncommon.

Measurements. ♀ 210. 250. 45. 16 mm.

Heliosciurus mutabilis shirensis (Gray)

Macroxus shirensis Gray, 1867, Ann. Mag. Nat. Hist. (3), **20**, p. 327: Shire River, Nyasaland.

4 (M. C. Z. 26442–5) Madehani, Ukinga Mtns. 13. ii. 30.
7 (M. C. Z. 26207–12, 26215) Nkuka Forest, Rungwe Mtn. 24. iii & 8. iv. 30.
1 (M. C. Z. 26541) Igale, Poroto Mtns. 25. iv. 30.

Native names. *Kiperemende* (Kikinga); *imbelemende* (Kinyakusa); *imbelembe* (Kinyika).

Discussion. In his recent paper on African squirrels, Major Ingoldby (1927) regards the race *chirindensis*, from Chirinda Forest of southeast Rhodesia, inseparable from typical *mutabilis* of Mozambique, leaving *shirensis* as the only other recognizable form of *mutabilis*, if this be regarded as a species distinct from the *undulatus* group.

The series of twelve specimens listed above is very uniform in dorsal coloration, an evenly mixed black, ochraceous and gray, in which the gray predominates. The hairs of the back are dark at the base, succeeded by a ring of dull ochraceous, then one of black, with a gray tip. In three from the Chirinda Forest the ochraceous element is much more marked, giving the back an obviously yellowish tone instead of gray. The cheeks are nearly clear gray, the tail has some sixteen or twenty black rings alternating with ochraceous, and overlain by the long white tips of the hairs. The lower surface of the body and limbs varies from nearly clear white with a line of buffy bounding the dorsal coloration, to a light buff which may be more intense on the hind legs.

Measurements. The largest ♂ measured 240. 270. 50. 15 mm.; the largest ♀ 250. 290. 50. 20 mm.; both are from Rungwe Mountain.

Breeding. No fetuses were found in any of the eight females.

Parasites. A flea (*Ceratophyllus infestus duratus* subsp. n.) was found on the Igale specimen.

Enemies. There was a great demand for the bodies by both Wakinga and Banyakusa who eat these animals.

Habits. It seemed a strange thing to me that after shooting two pairs of these squirrels on the day of our arrival at Madehani no more should be seen for ten days, though during the interval I shot ten examples of a new race of *byatti* and desisted from shooting more. Salimu, however, reported seeing two pairs feeding on wild fruit in a tree in the forest some two miles down the mountainside below our camp.

On February 23 I was sitting in my tent when I heard the familiar "kuwheking" call of *Aethosciurus byatti* and taking my field glasses I made my way to the forest edge. The "kuwheking" grew louder and noisier, though at intervals it was supplemented by a low growling note, an astonishing sound for a squirrel to produce. Suddenly another call broke out in a tree above, I can only liken it to the noise of someone tapping a nail with regularity, "peng-peng-peng"; at times this sound trailed off into a kind of squeak. Then I observed a squirrel descending a slightly sloping tree-trunk, approaching very slowly and with frequent pauses but continuously jerking its tail. This Shire Squirrel was within thirty feet before it saw me, and then, except for a start, stood its ground silently watching me, occasionally emitting its cry. All the time the angry "kuwheking" and growling continued very close to me until at last I discovered that the squirrel which was making the noise was between the trunks of two big trees which were growing from the same spot. This animal, a form of Byatt's Squirrel, was ten feet from me at most and only four feet from the ground. Suddenly it caught sight of me, stopped its cry and gazed spellbound for a matter of seconds; the next minute it vanished round the bole of one of these trees and then scampered away in the undergrowth. At this the Shire Squirrel bolted up its tree a further fifty feet or so but as I remained quiet, it began to descend; when it had come down to within forty feet I put the field glasses on it, watched it for some time and becoming tired at last, I turned away. The squirrel remained, head downwards on the trunk in the same exposed position and stared after me as I walked off. I thought the contrast in the behavior of the two animals was so remarkable that I wrote it down.

Aethosciurus byatti byatti (Kershaw)

Funisciurus byatti Kershaw, 1923, Ann. Mag. Nat. Hist. (9), **11**, p. 592: Moshi, Kilimanjaro, Tanganyika Territory.

Aethosciurus byatti Kershaw, 1923, Ann. Mag. Nat. Hist. (9), **11**, p. 708.

8 (M. C. Z. 26533–9, 26203) Kigogo, Uzungwe Mtns. 12–30. i. 30.

Native name. *Sindikuleti* (Kimhansa).

Discussion. Although no topotypical Kilimanjaro specimens are available for comparison, yet the series previously collected by Loveridge on the Usambara and the Uluguru ranges to the south, were considered to be specifically identical by Kershaw, while Loveridge

and I in a later paper agreed that specimens in comparable pelage from the two ranges showed no tangible differences. The range of *byatti* therefore extends from the Kilimanjaro forests, southward more or less interruptedly on the two ranges mentioned to the Uzungwe Mountains in southwestern Tanganyika, where a series of eight in fresh unbleached pelage was collected at Kigogo in January. They all agree in the bright ochraceous color of the feet and the distinctly greenish tint of the fur. November skins from the Usambara range are a distinctly brownish shade, due apparently to bleaching. This squirrel seems to be closely related to *ruwenzorii*, but is characterized by the less clearly defined white underparts, more rufous feet and forelimbs, and by the prevalence of white tips on the hairs of the distal four-fifths of the tail, which are apparently lacking in the distinctly banded tail of the Ruwenzori squirrels. For the present *byatti* may be regarded as a distinct species.

Measurements. The larger ♂ measured 200. 190. 50. 20 mm.; largest ♀ 225. 210. 50. 20 mm.

Habits. These squirrels are by no means common at Kigogo in such sections of the forest as I visited; moreover their habits made them far more difficult to collect than their relatives in the Uluguru and Usambara Mountains. When disturbed these latter usually sought refuge in the tops of the high forest trees and might be shot generally as they climbed, though in the Amani forests they often ascended out of gunshot range because the trees were so tall.

While a few of the trees in the Kigogo forest are of large size, the majority are small and I never saw Byatt's Squirrels more than twenty feet from the ground; usually they were at only half that height. At the slightest noise — and they were exceptionally alert — they would slip round to the reverse side of the trunk and descend to the ground where the tangle of undergrowth provided security and rarely afforded one the chance of a shot. Two other factors militated against the collector; at Kigogo these squirrels lacked that curiosity which causes so many members of the family to pause in flight for a moment to take a peep at the disturber of their peace, secondly their coloration renders them inconspicuous for practically all the tree trunks are heavily smothered in moss of a shade exactly like the body pelage while a pendant tail resembles one of the myriad trailing lichens.

AETHOSCIURUS BYATTI LAETUS subsp. nov.

6 ♂, 4 ♀ (M. C. Z. 26196–202, 26204–6) Madehani, Ukinga Mtns. 14–22. ii. 30.

Type. No. 26,198 Museum of Comparative Zoölogy. Adult ♂ skin and skull from Madehani, Ukinga Mountains, north end of Lake Nyasa, Tanganyika Territory. Collected by A. Loveridge, February 22, 1930.

Description. Similar to *A. byatti* but with muzzle and feet greenish ochraceous instead of rufous. Pelage long and full, the longest dorsal hairs about 19 mm. Entire upper surface from the nose to the tail and the basal inch or so of the latter a finely speckled olive green and black, the individual hairs black at base with a narrow subterminal ring of greenish yellow and a black tip. On each side of the muzzle is a patch of clear ochraceous extending, with some admixture of darker, to the area in front of and below the eye; forearms bright ochraceous, the hands and backs of the feet clear and slightly paler ochraceous in distinct contrast to the rufous tint of these parts in *byatti;* ankles and tibial region rusty, merging into the color of the back. A very small post-auricular patch of buffy. Chin and inguinal region greenish ochraceous; rest of the body below gray, the hairs mostly with slaty bases and dull whitish tips. Tail bushy, not tapering, the hairs of its distal four-fifths chiefly black above and below, with long white tips, and in addition a basal and often a central narrow band of buffy, which, however, does not produce a cross-barred effect such as is shown in Thomas and Wroughton's figure of *ruwenzorii.*

Skull. From the postorbital processes the temporal ridges continue backward in adults to meet at the occiput. The nasals are broad and extend back slightly beyond the level of the premaxillaries, their combined posterior border forming a bracket-shaped outline, with a median notch. At the sides the nasals are slightly pinched in with concave outline, and expand a very little distally.

Measurements. The field measurements of the type are: head and body 230 mm.; tail 200 mm.; hind foot without claw 50 mm., with claw 55 mm.; ear 20 mm.

The skull measurements are: greatest length 56 mm.; basal length 47 mm.; palatal length 27.5 mm.; nasals 17 mm.; zygomatic breadth 29.5 mm.; width outside molars 13.7 mm.; mastoid width 23 mm.; upper cheek teeth 10.5 mm.; lower cheek teeth 10.3 mm.

The largest ♂ measured 235. 265. 55. 20 mm., and the largest ♀ 235. 170. 50. 20 mm.

Discussion. This fine series of ten skins is from the northern end of Lake Nyasa, at a point which is apparently the most southerly known for this species, meeting and slightly overlapping the range of the very differently colored *A. lucifer*. It is noteworthy, however, that Loveridge did not actually find these two species occurring anywhere together, although it is possible that they may do so for *lucifer* extends its range well to the south.

Parasites. Fleas (*Ceratophyllus infestus duratus*) were plentiful on these animals.

Enemies. The bodies of these squirrels are in great demand for food among the Wakinga and the corpses of the above series were carried off as soon as skinned.

Habits. This species occurs in the same forest as *Heliosciurus mutabilis shirensis*, but is abundant while the latter is rare. Its cry "kuwhek-kuwhek" was indistinguishable from that of *byatti* at Kigogo. On February 18 I killed a pair with one shot as they were "kuwheking" to the accompaniment of jerking tails within six inches of one another. Another day, hearing the call being repeated with regularity, I crept in the direction of the sound and approached so softly that I was within three feet of the squirrel, which was in the grass, before it saw me. It was evidently intently listening to, or approaching, another animal which was calling about forty feet away. So startled was this squirrel that it dashed up the nearest tree, a bent-over sapling no thicker than a man's arm, which, as it was leaning in my direction, brought the animal to within six feet of, and level with, my head. I covered it with my gun automatically but did not fire for it would have resulted in blowing the creature to pieces. There we stood eyeing each other, neither moving, for a considerable time; finally I lowered the gun and immediately the squirrel was off like a flash, round the other side of a big tree and up to the very topmost branches far out of range. The difference in the conduct of Madehani squirrels as contrasted with those at Kigogo was noticed many times; while the latter sought refuge in the undergrowth the Madehani animals more usually ascended the trees.

Aethosciurus lucifer (Thomas)

Xerus (*Paraxerus*) *lucifer* Thomas, 1897, Proc. Zoöl. Soc. London, pp. 430, 932, pl. 54 (colored): Kombe Forest, Masuku Range, 7,000 feet, Nyasaland.

16 (M. C. Z. 26180–95) Nkuka Forest, Rungwe Mtn. iii–iv. 30.

Native name. Kasindi (Kinyakusa).

Discussion. This beautiful squirrel is apparently of very local dis-

tribution in the forests at the northern end of Lake Nyasa. Its striking orange body and tail, with the black middorsal stripe, give it a very different appearance from any other African squirrel, yet it shows its relationship to the *Acthosciurus* group in the curiously greenish-yellow tint where the orange of the hind legs pales into the gray of their inner side.

Measurements. The largest ♂ measured 260. 190. 55. 20 mm.; and ♀ 230. 210. 50. 20 mm. The sexes are equally divided and all adult.

Breeding. None of the females was pregnant.

Parasites. No external or internal parasites were found.

Habits. I heard the cry of this squirrel shortly after our arrival in the forest; to me the call seemed indistinguishable from that of *A. b. byatti* and the animal seemed equally noisy; the cry "ku whek" was heard chiefly in the late afternoon; whether it was raining or fine appeared to make no difference.

When disturbed these animals make for the tops of the highest trees which are tall enough to be out of gunshot range. It might be supposed from an examination of their handsome orange-red pelts with conspicuous black dorsal patch, that these squirrels would be very obvious among the verdure of the rain forest. This, however, is far from being the case for on many of the trees is an epiphytic fern of exactly the same shade of orange-red, while the dark midribs of the ferns are very similar to the dark dorsal patch of the squirrel.

Folklore. The following story was related by an old Mnyakusa living outside the forest who said that these squirrels will enter the Banyakusa granaries in search of food. Once upon a time a hare, hearing that a squirrel was going to raid a granary, suggested that they should go together, a request to which the squirrel acceded. They entered by the door which was not properly closed and began to feed. The hare fed so noisily, however, that the owner heard and went to inspect the granary. As he appeared in the doorway the squirrel escaped through a small hole in the opposite wall. The hare endeavoured to follow but, being too large to get through, it was overtaken and killed by the man. Whether this seemingly pointless tale had some basis in fact or was purely folklore I cannot say.

Paraxerus cepapi quotus Wroughton

Paraxerus cepapi quotus Wroughton, 1909, Ann. Mag. Nat. Hist. (8), **3**, p. 516: Katanga district, Belgian Congo.

♀ (M. C. Z. 26532) Kasanga, Lake Tanganyika. 16. v. 30.

Native name. Kapale (Kirungu).

Discussion. The single specimen from Kasanga in its pale mixed

gray coloration and white under parts, is almost a miniature of the *Heliosciurus undulatus rhodesiae* Wroughton from Kitungulu with, however, a slightly more ochraceous wash on shoulders and hindquarters. The type locality is the Katanga district of the southern Belgian Congo, considerably to the west of Kasanga across the lake, but the present specimen in its buffy, instead of white, hands and feet, seems to agree with this rather than with *P. c. soccatus* of the south end of Lake Nyasa (N. Angoniland) to which Wroughton says that "some specimens from the adjoining Nyasa-Tanganyika Plateau appear to belong." Possibly it is intermediate but suitable material for comparison is not at hand.

Two other specimens, collected in 1928 by Mr. F. G. Carnochan, extend the range of this bush squirrel northward to the vicinity of Tabora (Kewewe's and Mwanasomano's) in west central Tanganyika Territory. They seem to be identical in all respects with the Kasanga specimen.

Measurements. This fully adult ♀ measured 180. 165. 40. 15 mm.

Breeding. It was noted that the teats were enlarged.

Habitat. Shot in the dry scrub forest on the banks of Lake Tanganyika just south of the ruins of the old German fort and *boma*.

CRICETIDAE

Dipodillus harwoodi luteus Dollman

Dipodillus luteus Dollman, 1914, Ann. Mag. Nat. Hist. (8), **14**, p. 489: southern Guaso Nyiro, Kenya Colony.

♀ (M. C. Z. 26585) Dodoma, Ugogo. 23. xii. 29.

Native name. Mbadya (Chigogo).

Discussion. This specimen from Dodoma reflects in its pale buffy color above the desert conditions under which it lives. It is superficially similar to the pale *Leggada* from the same locality.

Measurements. ♀ 60. 74. 20. 10 mm.

Habitat. Taken about 8 p.m. when running about the road.

Tatera vicina muansae (Matschie)

Gerbillus (*Tatera*) *vicinus muansae* Matschie, 1911, Sitzber. Ges. naturf. Freunde Berlin, p. 333: Mwanza, Tanganyika Territory.

♂ (M. C. Z. 25690) Mangasini, Usandawi. 13. xii. 29.

Native name. Bumbi gubara (Kisandawi).

Discussion. A single very pale-buffy specimen, with black-tufted tail from Mangasini is practically identical with topotypes of *muansae*

from the southeastern end of Lake Victoria, indicating that this race covers an extensive area in western Tanganyika Territory. Farther east, it doubtless merges into the race *swaythlingi* which is only a little darker in the color of its dorsal surface as shown by topotypes in the collection.

Measurements. ♂ 155. 190. 36. 22 mm.

Tatera böhmi varia Heller

Tatera varia Heller, 1910, Smithsonian Misc. Coll., **56**, no. 9, p. 1: Loletai Plains, southern Guaso Nyiro, Kenya Colony.

♂ (M. C. Z. 26578) Dabaga, Uzungwe Mtns. 2. i. 30.
4 (M. C. Z. 26486, 26489, 26579–80) Ukerewe Id. 10. vi. 30.

Native names. Ingombwe (Kihehe); *isagai* (Kikerewe).

Discussion. These large gerbils are readily distinguished by their very long tails which are white all round in the distal third, and mixed black and ochraceous dorsally on the basal two-thirds. The specimen from Dabaga has a slightly darker back than those from Ukerewe Island, due to admixture of more black hairs. As noticed by Hollister the immature examples are a nearly uniform buffy gray above until the development of the ochraceous-tipped hairs is complete.

The type locality of *böhmi* is Mpala, Marungu, west of Lake Nyasa and Thomas has recorded it from Fort Hill in the northern part of Nyasaland. The subspecies *varia* is apparently not very different but for want of comparative material, the Ukerewe specimens are tentatively referred to it.

Measurements. The largest ♂ in the Ukerewe series measured: 185. 245. 45. 20 mm.; ♀ 155. 210. 45. 20 mm.; the Dabaga ♂ 180. 220. 42. 25 mm.

MURIDAE

Dendromus mesomelas nyasae Thomas

Dendromus nyasae Thomas, 1916, Ann. Mag. Nat. Hist. (8), **18**, p. 241: Nyika Plateau, northern Nyasaland.

♀ (M. C. Z. 26612) Kigogo, Uzungwe Mtns. 24. i. 30.
22 (M. C. Z. 26230–51) Madehani, Ukinga Mtns. ii. 30.

Native name. Nandalanendu (Kikinga).

Discussion. This seems to be the common species of tree mouse at the head of Lake Nyasa but scarcer in the Uzungwe Mountains where only a single specimen was secured, while further comparison shows

that the specimen previously recorded by us from the Uluguru Mountains as *nigrifrons* True is in reality *nyasae*. Thomas named this more northern form of the South African striped-backed mouse on the ground of its slightly shorter tail and more tawny, less fulvous flanks. The tail length, however, is variable in the present series, ranging from 90 to 110 mm. in the flesh, whereas Thomas's measurement of 85 from the dried vertebrae in place is probably too small. The color of the under side though on the average whitish, the hairs of chest and belly slaty based, may be slightly washed with ochraceous buff, or this may be confined to a broad collar on the throat.

The type and one other specimen on which this race was founded came from the northern part of the Nyika Plateau at the northwest end of Lake Nyasa, where it seems to have been outnumbered by *D. nyikae* of the Poemys group. It may be added that although Thomas regards his *D. insignis* from Nandi, Kenya Colony, as a species distinct from *nyasae*, the two really differ in little but size, the latter with a skull length of 22.5 mm. against 25 mm. in the more northern animal.

Measurements. The largest ♂ and ♀ both measured 80. 100. 20. 15 mm.

Breeding. Nos. 26,244–51 are all immature. The presence in late February of so many half-grown young would seem to indicate that the breeding season is early in the year at Madehani.

Dendromus melanotis nyikae Wroughton

Dendromus nyikae Wroughton, 1909, Ann. Mag. Nat. Hist. (8), **3**, p. 248: Nyika Plateau, northern Nyasaland.

♀ (M. C. Z. 26613) Ukerewe Id., Lake Victoria. 11. vi. 30.

Discussion. This tree mouse from Ukerewe Island is the only example taken of the subgenus *Poemys*, characterized by a nail instead of a claw on the fifth hind toe. It is nearly uniform tawny above, with a faintly marked middorsal line, dusky ears, and an ochraceous wash over the otherwise white feet and belly. Its evident and close relationship to *melanotis* have induced me to regard it as a subspecies, differing in "rather smaller" size.

Measurements. This breeding ♀ measured 70. 80. 18. 16 mm.

Breeding. This mouse was brought in together with her nest and eight young by a native. The nest was constructed of very fine grasses. The mother died during the night, presumably having been injured in capture, and her nose was partly eaten away by ants

before morning. A litter of eight is apparently a large number for a mouse of this genus to produce.

Diet, etc. One young one died but the rest throve on dry bread, potatoes, *mhoga*, etc. They were kept in a cage thickly carpeted with dry moss. An adult gerbil (*Tatera böhmi varia*) was introduced into their cage and to my astonishment the little tree mice took to sleeping with the big gerbil coiled round them; they invariably slept in a bunch and when disturbed might be taken up on one's hand without showing signs of great alarm. Within the week three young rats (*Mastomys coucha victoriae*) were added to the party, then half a dozen full grown rats (*Arricanthis abyssinicus rubescens*). I was afraid that the latter might do some injury to the wee mice, so a week later removed all but one of the *Arvicanthis*. The strangely assorted party of rodents then had a week of constant travelling and were none the worse, but had to be placed in a more suitable box instead of the glass-sided cage in which they had been living. On the night of July 8, i. e., four weeks after capture, they were left in Kilindini customs warehouse prior to embarkation next day. During the night the *Mastomys*, perhaps smelling all the good things with which they were surrounded, gnawed a hole in the side of the box and escaped, together with the *Dendromys*. The *Tatera* and *Arvicanthis* were too big for the hole and so remained, and in due course reached Europe. I mention this as it seems highly probable that the *Dendromus* will establish themselves upon Mombasa Island.

Thamnomys surdaster surdaster Thomas & Wroughton

Thamnomys surdaster Thomas & Wroughton, 1908, Proc. Zoöl. Soc. London, p. 550: Zomba, Nyasaland.

3 (M. C. Z. 26582–4) Dabaga, Uzungwe Mtns. 30. xii. 29.
2 (M. C. Z. 26660–1) Kigogo, Uzungwe Mtns. 16 & 22. i. 30.
2 (M. C. Z. 26262, 26407) Madehani, Ukinga Mtns. 20. ii. 30.

Native names. *Nyalutanda* (Kihehe); *tengela* (Kikinga).

Discussion. In this series of bush rats, the five from Uzungwe are very uniform in color of the back which is mixed ochraceous and black, giving a general dull yellowish brown, without the more rufous tints, but this is in part due to immaturity. The pair from Madehani are brighter, more rufous above, especially over the lower back and differ from all the other Tanganyika specimens examined in having the hind feet nearly pure white with a faint buffy tinge to the base of the metatarsus instead of having most of the foot buffy. Without

more specimens from the other parts of its range, however, the significance of the difference is not clear.

Measurements. The largest ♂ (Madehani) measured 125. 265. 25. 20 mm.; the largest ♀ (Kigogo) 125. 156. 25. 20 mm.

Breeding. A native youngster brought in a nest at Madehani on February 20, which held a female measuring 111. 164. 26. 18 mm., and two suckling young (preserved in alcohol), that measured ♂ 60. 55. 15. 7 mm., and ♀ 55. 45. 15. 8 mm.; these measurements, of which the adult and one young were taken by myself, tend to show that the very elongate tail is a more recent adaptation to arboreal life. The nest was almost spherical and a rat was seen to leave a similar nest which had been placed in a low thorny tree in a gloomy spot near the forest edge; the situation of the nest was about eight feet from the ground.

Thallomys damarensis scotti Thomas & Hinton

Thallomys scotti Thomas & Hinton, 1923, Proc. Zoöl. Soc. London, p. 494: Junction of Thika and Tana Rivers, Kenya Colony.

♂ ♀ (M. C. Z. 26484–5) Kikuyu, Ugogo. 26. xii. 29.

Discussion. These very beautiful black-masked tree rats were obtained in the dry thorn-bush country a few miles outside Dodoma and seem to agree perfectly with the description of *scotti* from Kenya Colony. The type of the genus is *T. nigricauda* of which *loringi*, described from Lake Naivasha, is a subspecies, and Thomas has described several other "species" from southwest Africa. Apparently, however, these various forms may be resolved into two (or perhaps at most three) species, typified by *nigricauda* larger and darker with the white hairs of the ventral side more or less slaty at their bases, and a smaller, buffier species, typified by *damarensis*, in which the hairs of the lower side are snowy white throughout to their bases. The black eye mask is a striking color marking, but appears to be somewhat variable, perhaps more reduced in the latter group. The contrastingly gray forehead, cheeks and flanks and the tendency to develop a whitish mark at the back of the ear, are also characteristic. As our specimens fall into the second group, they are provisionally regarded as a race of *damarensis*. Their capture apparently constitutes the first record for Tanganyika Territory, and the field notes corroborate other testimony as to the tree-living habits of the genus.

Measurements. ♂ 135. 160? 25. 20 mm.; ♀ 145. 160. 25. 20 mm.

Habits. On Christmas eve I was sitting in my tent when three rats

dropped in a bunch from the acacia tree overhead. Though they must have fallen ten feet they immediately rushed to the tree and disappeared. Later I saw them, silhouetted against the sky, actively running about in the branches but the sprays of the branches were too thick to make shooting possible. On Christmas day I told Salimu about them and remarked that if he wished to give me an Xmas present to secure these rats for me before we left. Next morning, after he had packed the last tent, and I was upon the lorry superintending the stowing of the last loads, shouts broke out around the tree — Salimu had introduced a wand into the hollow trunk of the acacia and poked out the rats from its base; he had grabbed one rodent and was chasing the other. Presently he approached me, a rat in either hand, and said, "Here is your Christmas present!" One of the creatures had bitten deeply into his finger but he never paid much attention to such wounds. I dressed it with iodine and it healed rapidly.

Rattus rattus kijabius (J. A. Allen)

Mus kijabius J. A. Allen, 1909, Bull. Amer. Mus. Nat. Hist., **36**, p. 169: Kijabe, Kenya Colony.

♂ ♀ (M. C. Z. 26576, 26578) Dabaga, Uzungwe Mtns. 1. i. 30.
♂ ♀ (M. C. Z. 26324–5) Ilolo, Rungwe district. 26. iii. 30.
♂ ♀ (M. C. Z. 26492–3) Ukerewe Id., Lake Victoria. 10. vi. 30.

Native names. *Ngosuwi* (Kihehe); *imbewa* (Kinyakusa); *imbeba* (Kikerewe).

Discussion. Hollister has indicated that the form of *Rattus rattus* common in eastern Africa is "certainly not typical of true *rattus* of northern Europe or of the subspecies *alexandrinus* of the Mediterranean shores of Europe and northern Africa." He has therefore used J. A. Allen's name *kijabius* for it, and regards *Mus mwanzae* and *M. rattiformis* of Matschie as synonyms. The several specimens listed above are very uniform in appearance and are undoubtedly all one form to which the name *kijabius* may be applied. The adults are dark grayish brown, with a buffy tint due to the mixture of many black hairs with others having a gray base, a narrow subterminal ochraceous ring and a minute black tip. On the sides of the body the ochraceous becomes paler, buffy and with less black, while the belly is clear gray washed with buffy. The feet are dark and there is often a small white fleck in the middle of the chest.

Measurements. The largest ♂ (Dabaga) measured 180. 200. 35. 25 mm.; and largest ♀ (Ukerewe) 155. 142. 130. 24 mm.

Diet, etc. On the night of December 30 I was disturbed a couple of times by a rat in my tent which was pitched in the bush half a mile from the nearest farm. The following night again I heard a noise and flashing my torch in the direction of the sound saw a rat's tail disappear behind a box; in the morning it was found that two skins of *Lophuromys a. aquilus* and one of *Thamnomys s. surdaster* had disappeared but were eventually found six feet away. While the arsenically treated skins were undamaged, the attached skull of one *Lophuromys* had the brain eaten out and the skull of *Thamnomys* had wholly disappeared. Two traps were set on the night of the 31st and baited with bread. At 12.30 p.m. I rose and found that the bait of both had been taken and one trap sprung though I had not heard any sound. I reset both after baiting with corned beef. Just before 5 a.m. I was awakened by one trap being sprung, the bait had been taken from the other without setting off the break-back wire. Beside the trap which was sprung was a large rat — temporarily stunned — I aimed a blow at it but it sprang past me and ran for a couple of feet before collapsing, when I killed it with another blow.

Enemies. Rats of this race were recovered from the stomachs of an Underlined Sand Snake (*Psammophis subtaeniatus*) and Puff Adder (*Bitis arietans*) at Mangasini.

Folklore. An old Mnyakusa at Ilolo related the following story which savours much of Aesop's fables. A lion was accustomed to bask daily upon a large rock and was lying stretched out in the sun one day when a rat, which had repaired to the spot for the same purpose, mistaking the lion for a boulder, ran over him and settled to sun itself upon the lion's shoulder. The lion, awakening, called out, "Who are you so small that you are running over my back with your dirty feet? If I were to eat you I should still be hungry for you would be lost between my teeth when I attempted to chew you." The rat replied, pertly, "Big as you are and think yourself, yet you are not so strong as I." The lion roared at this rejoinder and the rat scampered off.

Some while afterwards the lion visited a byre and in endeavouring to get at the cattle he put his head in a snare which the herdsman had set for such as he. Half choked he roared and coughed by turns. The rat, hearing the commotion, said to himself: "Whatever is the matter that he is making such a commotion?" Being curious, he ran to the place and seeing at a glance what was amiss he ran up the lion and gnawed at the rope till the lion was free. Thus he demonstrated that he was stronger than the lion. After the rescue they shook hands (or paws) and became friends again.

PRAOMYS TULLBERGI JACKSONI (De Winton)

Mus jacksoni De Winton, 1897, Ann. Mag. Nat. Hist. (6), **20**, p. 318: Entebbe, Uganda.

♂ (M. C. Z. 26424) Mabira Forest, Uganda. 1. vii. 30.

Discussion. This adult male from beneath the thatch of a fallen hut in a banana plantation on the outskirts of the Mabira forest at a point forty miles west of Jinja, Uganda, is almost a topotype of the race *jacksoni* and is contrastingly browner than the very dark form from southwestern Tanganyika Territory described below.

Measurements. ♂ 130. 145. 25. 20 mm.

Parasites. Two fleas and a larval mite in its fur escaped preservation.

PRAOMYS TULLBERGI MELANOTUS subsp. nov.

1 (M. C. Z. 26498) Kigogo, Uzungwe Mtns. 24. i. 30.
11 (M. C. Z. 26259, 26387–94, 26411, 26497) Madehani, Ukinga Mtns. 19–28. ii. 30.
8 (M. C. Z. 26285–92) Nyamwanga, Poroto Mtns. 17. iii. 30.
1 (M. C. Z. 26293) Ilolo, Rungwe district. 26. iii. 30.
3 (M. C. Z. 26295–7) Nkuka Forest, Rungwe Mtn. 17. iv. 30.

Native names. Nandalanendu (Kikinga); *imbingi* (Kinyika); *imbewa* (Kinyakusa).

Type. No. 26,287 Museum of Comparative Zoölogy. Adult ♂ skin and skull from Nyamwanga, Poroto Mountains, northwest end of Lake Nyasa, Tanganyika Territory. Collected by A. Loveridge, March 21, 1930.

Description. A very dark, saturated race: general color above, including muzzle to eyes, the forehead, ears and central area of the back, dark blackish brown, many of the hairs entirely black, others with minute subterminal ochraceous rings that are barely noticeable; on the sides of the face and body and on the nape, these rings are longer, producing a dull rufous to ochraceous wash over these areas. Lower surfaces dull grayish white, the hairs everywhere with slaty bases. The tail, which equals the head and body in length, is blackish all around, with narrow rings, between which come out minute blackish-brown hairs, scarcely visible except with a lens. The feet are very dark smoky brown, with silvery toes, slightly mixed with duller on the hind feet.

The skull is of the usual slender narrow type, with long narrow nasals terminating in a slightly notched transverse line on a level

with the posteriormost extension of the premaxillaries; the incisive foramina just reach the level of the front edge of the molars instead of penetrating to the level of the anterior third of m^1. Although Hollister regarded the East African forms as subspecies of *tullbergi* of the Cameroons, it seems quite probable that they are instead a distinct species, *jacksoni*, differing in the larger ears with consequently larger auditory bullae, and having the outer cusp of the first transverse lamina in the upper m^1 well developed instead of obsolete.

Measurements. The field measurements of the type are as follows: head and body 120 mm.; tail 120 mm.; hind foot 25 mm.; ear 25 mm. The largest pair in the Nyamwanga series measured: ♂ 125. 130. 23. 20 mm.; ♀ 112. 124. 24. 19 mm.

The skull of the type measures: greatest length 29.0 mm.; basal length 23.9 mm.; palatal length 14.3 mm.; incisive foramina 5.5 mm.; zygomatic width 13.2 mm.; breadth of brain case 12.0 mm.; upper tooth row 5.0 mm.; lower tooth row 4.8 mm.; across molars 5.4 mm.

Discussion. This race is closely related to *P. jacksoni* (type locality, Entebbe) and the subspecies *delectorum* (type locality, Mlanje, southern Nyasaland). It differs noticeably from both, however, in its extremely dark appearance, a series looking nearly blackish in most lights, while *jacksoni* is a distinctly ochraceous animal and *delectorum*, though somewhat darker, differs in the decided rusty wash of the forehead and fore back, while both *jacksoni* and *delectorum* have white hands instead of dark with whitish fingers. The extremely saturated appearance of this new race is doubtless to be correlated with the abundant moisture and rainfall of the area it inhabits among the mountains at the head of Lake Nyasa. In this connection, comparison has again been made with the skins from the Uluguru Mountains previously referred to *delectorum*. Although these are a shade darker above than a topotype of the latter, they are not very different and in their white feet and slightly rusty foreheads, are closer to it than to *melanotus*, and on the whole may be referred to *delectorum* until a more thorough knowledge of the variation shown by specimens from the intermediate area is available.

Breeding. At Madehani, on February 21, a native brought me a female rat together with four well-grown young. I noticed that the mother had four pairs of nipples.

Habitat. The female and young had been killed in a wheat granary. Wheat-growing was introduced by missionaries and wheat is now the staple article of diet among the Wakinga who build granaries — rather resembling big beehives of the skep type on stilts — in which

to protect their grain from rats. I was surprised to learn that the common rat (*Rattus r. kijabius*) was not present at Madehani. Most of the Madehani series were taken in snap-back rat traps baited solely with ground-nut butter and set at the forest edge. That the rats emerge to feed shortly after darkness falls I ascertained by visiting the traps at 8 p.m., a necessary procedure where ants are so numerous. At Rungwe a rat was taken in a trap baited with meat.

Hylomyscus weileri (Lönnberg & Gyldenstolpe)

Rattus (*Praomys*) *weileri* Lönnberg & Gyldenstolpe, 1925, Ark. for Zoöl., **17**, B, No. 5, p. 3: Burunga, western foothills of Mt. Mikeno, eastern Belgian Congo.

1 (M. C. Z. 26499) Kigogo, Uzungwe Mtns. i. 30.
8 (M. C. Z. 26406, 26409–10, 26412–6) Madehani, Ukinga Mtns. 24. ii. 30.

Discussion. A single adult from Kigogo and the series of eight rats from Madehani, adult and immature, are provisionally placed under this species, with the description of which they agree. They are small long-tailed tree rats, having but six mammae, and in comparison with *H. denniae* are shorter-haired and much duller colored, lacking the bright ochraceous tints; instead they have a dark brownish back minutely ticked with buff which is clearer along the sides of head and body. The feet are a little shorter and the skull is smaller with a shorter rostrum than in *denniae* which in a general way they appear to considerably resemble. The immature animals are much darker through lack of the buffy-tipped hairs, which in adults give a buffy tint to the entire dorsal surface. The hind feet average about 20 mm. in length against 22 or 23 mm. in *denniae* and the tails also are a few millimetres shorter, usually 125 to 140 mm.

Here should be mentioned that in our former paper on "Mammals from the Uluguru and Usambara Mountains, Tanganyika Territory," five specimens of a *Hylomyscus* from Vituri were erroneously included with *Praomys delectorum*. These, although a trifle less dark above, are clearly the same as the Madehani *Hylomyscus*, bearing about the same relation to the latter as the specimens of *Praomys* from those mountains do to the very little darker series which we have named *melanotus* from the mountains north and northwest of Lake Nyasa. This *Hylomyscus* then has a somewhat extensive range from the Lake Kivu country south to the Livingstone Mountains and eastward in forest areas to the Uluguru Mountains near the east coast.

Measurements. The largest ♂ measured 80. 110. 20. 20 mm.; and largest ♀ 80. 140. 20. 20 mm.

Habits. After being completely defeated by the galagos moving their quarters I took up a position at sunset one evening to watch the lacework of branches at the forest edge as silhouetted against the sky. Presently I saw a small animal running along the twigs of a tree, pause for a moment at its tip, then take a leap, worthy of a galago, which landed it in the twigs of the next tree. A minute or two later it was followed by a second, while at intervals others arrived until I had counted eight, most of which may have been *Claviglis*. I heard squeaking in the tree from which they had come, a typical rain-forest giant, smothered in lianas and tree ferns of several species. These formed a dense mat around every branch.

The following morning Salimu essayed to climb the tree but its girth, combined with the slipperiness of its bark, prevented him. Nothing daunted he climbed thirty feet up the perfectly smooth stem of an adjacent tree whose top leaned against the forest giant. Incidentally on descending three hours later he offered twenty cents to anyone who could climb this tree. Only one of the half-dozen natives present took up the challenge and, failing, he came sliding down to the accompaniment of a chorus of jeers from his companions.

When about forty feet up Salimu discovered the well-worn trail I had told him to look for; before he could ascend farther, however, it was necessary to dislodge a great mass of ferns and moss together with a quantity of dead leaves which had accumulated among the fronds of the former. As this matted growth crashed to earth a number of dormice sprang from it — at least five I should think. I was alone below and regret to say that all escaped. I was sure that my helmet covered one but on raising the helmet found the dormouse gone. I searched in the neighbouring grass and caught it by the tail but the tip came off and the rodent was fifty feet up a tree in a moment; fortunately I was able to shoot it without damage. I returned to camp for a couple of boys, a saw, axe, ball of string, etc. Having drawn up the saw Salimu cut off branch after branch and as they crashed to earth we rushed to examine them. Two more dormice were secured in this way but so nimble were the little creatures in ascending adjacent trees that I should not care to say how many we lost.

Salimu then set about methodically stripping the branches of their parasitic growths, working downwards towards the main stem. In doing so he dislodged eight rats, all of which we captured. If others escaped we were not cognizant of it. They were certainly not nearly as nimble and active as the dormice.

Hylomyscus stella kaimosae (Heller)

Epimys alleni kaimosae Heller, 1912, Smithsonian Misc. Coll., **59**, no. 16, p. 7: Kaimosi, Kenya Colony.

♂ ♂ ♀ ♀ (M. C. Z. 26420–3) Mabira Forest, Uganda. 1. vii. 30.

Discussion. Through the kindness of Dr. Remington Kellogg of the United States National Museum, we have had topotypes of this forest mouse for comparison and they are identical with the above series from the Mabira Forest which lies to the west of Kaimosi. Their small size and bright ochraceous color, with somewhat darker mid-dorsal area are distinctive.

Measurements. All in the series were uniform in size, viz. 80. 125. 16. 15 mm.

Habitat. Five of these tree mice were found in a much decayed, but still standing, tree trunk; one escaped.

Mastomys coucha victoriae (Matschie)

Mus (*Epimys*) *microdon victoriae* Matschie, 1911, Sitzber. Ges. naturf. Freunde Berlin, p. 342: Mwanza, Tanganyika Territory.

21 (M. C. Z. 26294, 26298–308, 26315–21, 26323) Ilolo, Rungwe. iii. 30.
2 (M. C. Z. 26494–5) Igale, Poroto Mtns. 29. iv. 30.
3 (M. C. Z. 26500, 26512, 26515) Kitungulu, Urungu. 14. v. 30.
4 (M. C. Z. 26490–1, 26512–3) Ukerewe Id., Lake Victoria. vi. 30.

Native names. Imbewa (Kinyakusa); *pwela* (Kirungu); *imbeba* (Kikerewe).

Discussion. A series of multimammate mice representing *Mastomys coucha* was secured from the above localities mostly lying between Lakes Nyasa and Tanganyika. They seem to be indistinguishable from those taken on Ukerewe Island in Lake Victoria, which is undoubtedly the same as Matschie's *victoriae* from the adjacent shore, and I have therefore referred them all to that race provisionally. It may be that these are not sufficiently different from *M. coucha microdon* from the Zambesi to be separable, but adequate material for comparison is not at hand. They are readily told from the race *ugandae* by their clear gray bellies, lacking the brownish wash of the latter. The immatures are a dark gray above, hardly lightened by the buffy tint which becomes well developed, especially along the sides, in the adults.

Measurements. The largest ♂ (Ilolo) measured 164. 125. 25. 18 mm.; and ♀ (Ukerewe) 140. 125. 25. 20 mm.

Breeding. The Kitungulu specimens consist of a ♀ and a pair of young, each of which measures 70. 52. 16. 7 mm.

Parasites. Nematodes (*Arduenna* sp. and *Protospiura muricola*) were recovered from the stomachs of Ilolo and Ukerewe specimens respectively, while mites were also found in the fur of a rat from Ukerewe Island.

Leggada triton murilla Thomas

Leggada triton murilla Thomas, 1910, Ann. Mag. Nat. Hist. (8), **5**, p. 91: Machakos, Kenya Colony.

3 (M. C. Z. 26507–9) Dabaga, Uzungwe Mtns. 28. xii. 29.
2 (M. C. Z. 26510–1) Luvuna, Uzungwe Mtns. 9. i. 30.
6 (M. C. Z. 26501–6) Kigogo, Uzungwe Mtns. i. 30.
3 (M. C. Z. 26404, 26260–1) Madehani, Ukinga Mtns. ii. 30.
1 (M. C. Z. 26313) Ilolo, Rungwe district. 26. iii. 30.

Native names. Bunda (Kihehe); *sesi* (Kinyika); *imbewa* (Kinyakusa).

Discussion. This large, gray-bellied, pygmy mouse is widely distributed in East Africa, from Machakos in Kenya Colony, southward and westward. The series includes adults and immature individuals, the latter less bright in color than the former.

Measurements. The largest ♂ (Kigogo) measured 70. 50. 15. 11 mm.; and largest ♀ (Ilolo) 85. 55. 16. 10 mm.

Leggada bella induta Thomas

Leggada induta Thomas, 1910, Ann. Mag. Nat. Hist. (8), **5**, p. 89: Molopo, northern Bechuanaland.

♀ (M. C. Z. 26521) Ludilo, Uzungwe Mtns. 8. i. 30.
♂ ♀ (M. C. Z. 26522–3) Nyamkolo, Lake Tanganyika. 10. v. 30.
♂, 3 ♀ (M. C. Z. 26517–20) Kitungulu, Urungu. 15. v. 30.
♀ ♀ (M. C. Z. 26524–5) Albertville, Lake Tanganyika. 21. v. 30.

Native name. Kuzuru (Kirungu).

Discussion. Apparently adults of this pygmy mouse are less easy to obtain than immature examples. The series of nine, old and young, is very uniform in color with dark median dorsal area, more russet sides than the brighter russet of typical *L. bella*. It appears to represent the subspecies described by Thomas from northern Bechuanaland.

Measurements. The larger ♂ (Nyamkolo) measured 46. 45. 10. 8 mm.; and ♀ (Albertville) 65. 50. 15. 10 mm.

Breeding. The Ludilo specimen was found beneath a hollowed log where it had its nest; this was about five inches in diameter and was composed of loosely woven dry grasses, coarser outside and fine and soft at the centre. The log was lying on rubbish-strewn ground on the outskirts of a village. The Kitungulu series consists of a mother and three young which I dug from a village rubbish heap; no nest was seen. The young male measured 40. 30. 13. 10 mm. and the two young females 50. 40. 13. 10 mm.

Habitat. The Albertville mice were taken beneath a bundle of grass and a sheet of galvanized iron respectively.

Leggada gerbillus spec. nov.

♂ (M. C. Z. 26586) Dodoma, Ugogo. 23. xii. 29.

Type. No. 26,586 Museum of Comparative Zoölogy. An adult ♂ skin and skull from Dodoma, Ugogo, Tanganyika Territory. Collected by A. Loveridge, December 23, 1929.

Description. A very pale species with a conspicuous pure white area below and behind each ear.

Above, from base of whiskers to tail, as far ventrally as a line about a millimetre below the eye, and excluding the free part of the fore leg, a clear "warm buff," darkened by admixture of blackish hairs over a very narrow median area that is darkest on the crown and ends in a point on the forehead at the level of the eyes. The clear buff of the sides extends down the outer side of the hind limb to the ankle. Lips, lower cheeks, entire fore legs, belly and hind feet, as well as a conspicuous ring from the inner base of the ear around the posterior side of the outer base, pure white to the roots of the hairs. Tail thinly clad with very minute appressed hairs which are dark brown above and whitish below.

The skull compared with that of *L. bella* is obviously shorter in the rostrum with wider incisive foramina, which penetrate between the tooth rows not quite to the level of the antero-internal tubercle of m^1. The palate is more prolonged, so that the median posterior border is a millimetre behind the level of the last molars. The masseteric knob is prominent and about halfway back on the zygomatic plate instead of near its anterior edge. The upper incisors curve strongly backward at their tips. The audital bullae are obviously smaller.

Measurements. The field measurements of the type specimen are practically those of *L. bella* but the tail is shorter: head and body 55 mm.; tail 35 mm.; hind foot 13 mm.; ear 10 mm.

The skull measures: greatest length 17.0 mm.; basal length 14 mm.; palatal length 9.6 mm.; incisive foramina 3.5 mm.; zygomatic width about 9 mm.; across m^1 4.5 mm.; upper tooth row 3.4 mm.; mandible (condyle to tip of incisor) 11.2 mm.; lower tooth row 2.2 mm.

Discussion. Of this little mouse only a single specimen was secured, but after careful comparison with specimens and descriptions I am quite unable to reconcile its characters with any of them, so have regarded it as a new species, probably of the *bella* group, but different in the proportions of the skull, length of palate, and position of masseteric knob. Its almost uniform clear buffy coloring, only slightly darkened on the median line, and the conspicuous white area surrounding the back of the ear, give it at first sight quite the appearance of a pygmy gerbil or immature *Steatomys.* In other specimens of the group available the white spot below the ear is either absent or very inconspicuous.

Habitat. Taken running about the road on outskirts of town about 8 p.m.

Cricetomys gambianus viator Thomas

Cricetomys gambianus viator Thomas, 1904, Ann. Mag. Nat. Hist. (7), **13**, p. 413: Likangala, Nyasaland.

5 (M. C. Z. 26452–5, 26542) Nkuka Forest, Rungwe Mtn. iii–iv. 30.

Distribution. This pouched rat also occurs in native gardens at Madehani, Ukinga Mountains.

Native names. Benga and *akabenga* (Kinyika and Kinyakusa).

Discussion. This subspecies of giant rat ranges from the Southern Lake Region to Mozambique. With increasing age, the white of the underside is replaced by a dull buffy tint across the chest and upper abdomen.

Measurements. The only ♂ measured 340. 380. 70. 40 mm.; the largest ♀ 380. 375. 75. 40 mm.

Breeding. There were no fetuses in any of the four females but one taken on April 14 appeared to be nursing young.

Parasites. Orthopteran parasites (*Hemimerus nanseni*) and a flea (*Ceratophyllus infestus duratus*) were collected from one of these rats.

Lophuromys aquilus aquilus (True)

Mus aquilus True, 1892, Proc. U. S. Nat. Mus., **15**, p. 460: Mt. Kilimanjaro, 8,000 feet, Tanganyika Territory.

3 (M. C. Z. 26622–4) Dabaga, Uzungwe Mtns. 30. xii. 29.
10 (M. C. Z. 26627–36) Kigogo, Uzungwe Mtns. i. 30.
2 (M. C. Z. 26263, 26385) Madehani, Ukinga Mtns. ii. 30.
2 (M. C. Z. 26328, 26378) Nkuka Forest, Rungwe Mtn. iii–iv. 30.
1 (M. C. Z. 26625) Igale, Poroto Mtns. 29. iv. 30.
1 (M. C. Z. 26626) Ukerewe Id., Lake Victoria. 11. vi. 30.

Distribution. A damaged specimen was brought to me at Nyamwanga.

Native names. Nyakihuku (Kihehe); *kursi* (Kikinga); *nguya* (Kinyika); *imbewa* (Kinyakusa); *imbeba* (Kikerewe).

Discussion. Although the above series shows more or less variation in color, they can be matched in every respect by specimens from Mt. Kenya which, as Hollister has shown, are really inseparable from typical *aquilus,* although regarded by Dollman as distinct under the name *zena* (type from the Aberdare Range, Kenya Colony). The latter author has given the name *rita* to a slightly redder race from the Katanga, but there seem to be no grounds for regarding any of the present series as different from *L. aquilus.*

Measurements. The largest ♂ measured 140. 75. 20. 20 mm.; largest ♀ 135. 85. 20. 20 mm., both from Dabaga.

Breeding. Two of four females trapped at Kigogo on 24. i. 30 held fetuses; one held two measuring 45. 18. 8. 4 mm., the other three measuring 52. 20. 10. 5 mm.

Habitat. It was noted that at both Madehani and Nkuka these rats were diurnal and were successfully trapped with meat bait. The tails of this species are very apt to be reduced to a mere stump, presumably through fighting among themselves; many were rejected on this account.

Lophuromys sikapusi ansorgei De Winton

Lophuromys ansorgei De Winton, 1896, Proc. Zoöl. Soc. London, p. 607, pl. 27: Kavirondo, Lake Victoria, Kenya Colony.

4 (M. C. Z. 26376–7, 26379, 26384) Madehani, Ukinga Mtns. 19–22. ii. 30.

Native name. Kursi (Kikinga).

Discussion. The four specimens listed above were the only ones secured and it is interesting to note that Madehani is the only locality

where both this species and *L. a. aquilus* were found together, for their general areas of distribution overlap. Typically *L. sikapusi* is the species of the West African forest area, while the speckled *L. aquilus* is characteristic of eastern Africa. Considering the amount of individual variation shown in these mice, there is surprisingly little difference between those of central and western Africa. Externally the Madehani series is not distinguishable from two skins from Liberia considered to represent *sikapusi* whose type locality is the Gold Coast, but specimens from the Cameroons seem to average a little darker above. De Winton named *ansorgei* from Kavirondo, Victoria Nyanza, distinguishing it from *sikapusi* by its "rather larger size and much darker colouring," but with more specimens for comparison these differences seem very small indeed. I have, therefore, used the name in a subspecific sense until a more thorough revision can be made. It seems obvious that Matschie's *L. sikapusi manteufeli* from Mwanza, Victoria Nyanza, based on an imperfect specimen in alcohol, is a synonym.

Measurements. The largest ♂ measured 115. 65. 22. 16 mm.; the only ♀ 95. 65. 20. 15 mm.

Diet. Trapped with meat bait during the day, the trap being set at the forest edge.

Dasymys ? helukus Heller

Dasymys helukus Heller, 1910, Smithsonian Misc. Coll., **54**, p. 2: Sirgoit, southeast of Mt. Elgon, Kenya Colony.

♂ (M. C. Z. 26663) Dabaga, Uzungwe Mtns. 2. i. 30.
♀ (M. C. Z. 26659) Kigogo, Uzungwe Mtns. 17. i. 30.
♂ ♀ (M. C. Z. 26360, 26408) Madehani, Ukinga Mtns. 20. ii. 30.
♂ ♀ (M. C. Z. 26312, 26322) Ilolo, Rungwe. iii–iv. 30.
♀ (M. C. Z. 26662) Igale, Poroto Mtns. 24. iv. 30.

Native names. Ikumba (Kihehe); *ngerule* (Kikinga); *imbewa* (Kinyakusa).

Discussion. This small series from five different localities in southwestern Tanganyika is quite uniform in general appearance, a dull mixed reddish brown and black above, paling to ochraceous and black lined on the sides, and a curious shade of whitish below, faintly tinged with light olive buff. They are nearly indistinguishable from *D. helukus* of the plateau to the southeast of Mt. Elgon, and are provisionally placed with that animal in the absence of comparable specimens of *incomtus* which comes from much farther south (Natal), or of the Congo races.

The shape of the skull is quite characteristic with the curiously depressed nasals, pinched together at their tips, the strong sharp interorbital ridges, and the deep palatal gutter continuous from the incisive foramina to the hind margin of the palate. A small series from the Lualaba River seems to be closely similar.

Measurements. The largest ♂ (Ilolo) measured 172. 151. 31. 19 mm.; the largest ♀ (Madehani) 172. 151. 31. 19 mm.

Breeding. A female, only 150 mm. in head and body length, was brought in at Ilolo on April 17, together with three nestlings, whose eyes were still unopened. The nestling ♂ measured 70. 50. 18. 10 mm., and the ♀ ♀, 60. 55. 18. 10 mm.

Pelomys fallax insignatus Osgood

Pelomys fallax insignatus Osgood, 1910, Ann. Mag. Nat. Hist. (8), **5**, p. 276: Fort Hill, Nyasaland.

♂ (M. C. Z. 26311) Ilolo, Rungwe. 8. iv. 30.
♀ (M. C. Z. 26657) Tukuyu, Rungwe. 21. iv. 30.

Native names. Siangi (Kinyakusa).

Discussion. Of these two specimens, from localities only ten miles apart and situated in southwestern Tanganyika Territory, both agree in the lack of a dark dorsal line and in the coarse nature of the pelage, but the male is much the paler, almost golden, becoming very little rufescent at the base of the tail, and white below with faintly gray bases to the hairs. The female is much darker and has the whole fore part of the chest strongly ochraceous buff.

Measurements. ♂ 140. 140. 35. 20 mm.; ♀ 160. 155. 32. 20 mm.

Enemies. The female was caught and presented by a cat.

Arvicanthis abyssinicus rubescens Wroughton

Arvicanthis abyssinicus rubescens Wroughton, 1909, Ann. Mag. Nat. Hist. (8), **4**, p. 358: Kibero, Unyoro, Uganda.

12 (M. C. Z. 26361–72) Entebbe, Uganda. 27. vi. 30.

Native names. Imbeba (Kinyoro); *mesi* (Luganda).

Discussion. The dozen specimens from Entebbe represent the form common in Uganda west of the Nile, about the northwestern end of Lake Victoria. They are characterized by their dark blackish color with a reddish wash over the back. This is often due to fading for in

fresh pelage the paler portions are more nearly ochraceous. A trace of the dark median line can usually be made out.

Measurements. The largest ♂ measured 175. 115. 30. 20 mm.; the largest ♀ 160. 130. 30. 20 mm.

Breeding. The largest ♀ held six embryos measuring 36 mm. in head and body; 15 mm. tail; 7 mm. hind foot; the ears were folded and too small to measure in the field.

Arvicanthis abyssinicus muansae (Matschie)

Mus (*Epimys* ?) *muansae* Matschie, 1911, Sitzber. Ges. naturf. Freunde Berlin, p. 340: Mwanza, Tanganyika Territory.

♂ ♂ ♀ (M. C. Z. 26619–21) Mwanza, Lake Victoria. 6. vi. 30.

Native name. *Imbeba* (Kikerewe).

Discussion. These three topotypes of the race *muansae* are interesting to compare with their close relative, *neumanni*, of which a series was also secured near the type locality. The latter is a very pallid animal, with almost clear buffy-white sides, while those from Mwanza are appreciably darker with a faint suggestion of a dorsal line and with darker sides. How distinct it may be from the more northern races, the material at hand is insufficient to show.

Measurements. ♂ 135. 100. 25. 15 mm.; ♀ 120. 100. 25. 15 mm.

Enemies. Another of these rodents was recovered from the stomach of a Brown House Snake (*Boaedon lineatus*).

Arvicanthis abyssinicus neumanni (Matschie)

Mus neumanni Matschie, 1894, Sitzber. Ges. naturf. Freunde Berlin, p. 204: Burungwe, near Irangi, Tanganyika Territory.

7 (M. C. Z. 25691, 93, 25700, 03, 05–07) Unyanganyi, Turu. 5. xii. 29.
10 (M. C. Z. 25692, 94–99, 25701, 02, 04) Mangasini, Usandawi. 12. xii. 29.

Discussion. This series of seventeen skins, consisting of nine males and eight females, comes from localities which are a comparatively short distance west or southwest of the type locality, Burungwe. They are very uniform in their pale appearance, and show no trace of the dark median line.

Measurements. The largest ♂ measured 130. 115. 25. 15 mm.; and ♀ 135. 130. 25. 15 mm.

Lemniscomys striatus massaicus (Pagenstecher)

Mus (*Lemniscomys*) *barbarus* var. *massaicus* Pagenstecher, 1885, Jahrb. Hamburg Wiss. Anst., **2**, p. 45: Lake Naivasha, Kenya Colony.

♀ (M. C. Z. 26614) Ukerewe Id., Lake Victoria. 16. vi. 30.
♀ (M. C. Z. 26382) Mabira Forest, Uganda. 1. vii. 30.

Native name. *Imbeba* (Kikerewe).

Discussion. Considering the abundance of this species in some localities, it is rather noteworthy that the above-listed rats were the only ones secured. Although rather pale like *maculus*, it has the large hind foot of the *striatus* group.

Measurements. The larger ♀ (Ukerewe Id.) measured 130. 145. 25. 16 mm.

Rhabdomys pumilio diminutus (Thomas)

Isomys pumilio diminutus Thomas, 1892, Proc. Zoöl. Soc. London, p. 551: Mianzini, east of Lake Naivasha, Kenya Colony.

13 (M. C. Z. 26599–611) Dabaga, Uzungwe Mtns. xii. 29–i. 30.
12 (M. C. Z. 26587–98) Kigogo, Uzungwe Mtns. i. 30.
1 (M. C. Z. 26867) Tandala, Ukinga Mtns. 11. ii. 30.
4 (M. C. Z. 26863–6) Madehani, Ukinga Mtns. 15. ii. 30.
3 (M. C. Z. 26271, 26282, 26287) Nyamwanga, Poroto Mtns. 17. iii. 30.
11 (M. C. Z. 26272–80, 26284) Ilolo, Rungwe. iii. 30.

Native names. *Nyagalla* (Kihehe); *bunga* (Kikinga); *malamala* (Kinyakusa and Kinyika).

Discussion. There is considerable variation in color in the above series, but this is apparently a matter of age or individuality. The two pale dorsal stripes may be nearly whitish or rather gray like the sides, and the amount of yellowish wash on the shoulders and sides varies in intensity. Two old adults are rather paler than the rest of the specimens. The ears in this species are conspicuous by their contrasting rusty color with a small intensely black spot covering the proectote (outer anterior portion).

Measurements. The largest ♂ measured 135. 75 (missing tip). 20. 12 mm.; and largest ♀ 120. 100. 20. 15 mm.

Parasites. Nematode worms (*Arduenna* sp.) were found in a Dabaga rat.

Enemies. At Igale, Poroto Mountains, one of these rats was recovered from the stomach of a Puff Adder (*Bitis arietans*).

Otomys percivali Dollman

Otomys percivali Dollman, 1915, Ann. Mag. Nat. Hist. (8), **15**, p. 168: Lake Olbollossat, Naivasha district, Kenya Colony.

12 (M. C. Z. 26645–53, 26655–6, 26664) Dabaga, Uzungwe Mtns. xii. 29–i. 30.

8 (M. C. Z. 26637–44) Kigogo, Uzungwe Mtns. 14–31. i. 30.

Native name. *Gudi* (Kihehe).

Discussion. This fine series from the Uzungwe Mountains corresponds in every detail to Dollman's description of *O. percivali*, itself probably a close relative of *O. jacksoni* from Elgon, and perhaps only subspecifically different. It is of large size, and externally resembles *O. tropicalis*, but has coarser fur and is considerably paler in its general ochraceous tint, heavily lined with black. The ochraceous band on the dorsal hairs is paler and wider than in *tropicalis*. The skull is obviously arched in profile, with prominent raised ridges over the eyes, and strongly depressed rostrum. The lower incisors have two deep grooves, the last upper molar has seven laminae, the first lower molar four. The nasal bones are of the usual spatulate form, but do not exceed 7.5 mm. in combined width. Nearly all of the series are adult or approximately so.

This species has apparently not been found hitherto except at the type locality, twelve miles south of Lake Olbollossat, Naivasha district, Kenya Colony. The present record is, therefore, a considerable extension of the known range, to the southern part of the Tanganyika Plateau, and perhaps marks its southward limit.

There seems to be something of particular interest in the local distribution of the species of this genus. The above series from two localities in the Uzungwe Mountains and the species following were the only examples of the genus collected on the present trip. In 1922, however, one of Mr. Loveridge's trained collectors secured two of the very large *O. angoniensis elassodon* between Iringa and Dabaga. Of the similar but smaller species *O. nyikae*, nothing was found, nor of the *O. tropicalis* group, which is mainly of more northern distribution. On the present expedition, at Madehani, at the north end of Lake Nyasa, none of these species was found, but instead a good series of an undescribed form.

Measurements. The largest ♂ measured 215. 85. 23. 15 mm.; and largest ♀ 170. 95. 25. 20 mm.

Parasites. Nematodes (*Wellcomia* sp.) were found in the stomach of a Kigogo Swamp Rat.

OTOMYS (ANCHOTOMYS) ANCHIETAE LACUSTRIS subsp. nov.

♀ (M. C. Z. 26654) Dabaga, Uzungwe Mtns. 2. i. 30.
♀ (M. C. Z. 26359) Tandala, Ukinga Mtns. 11. ii. 30.
14 (M. C. Z. 26344–51, 26353–8) Madehani, Ukinga Mtns. ii. 30.
♀ (M. C. Z. 26326) Ilolo, Rungwe district. 31. iii. 30.
♂ (M. C. Z. 26658) Igale, Poroto Mtns. 30. iv. 30.

Native names. Gudi (Kihehe); *nuke* (Kikinga); *mbewa* (Kinyakusa); *sogo* (Kinyika).

Type. No. 26,358 Museum of Comparative Zoölogy. Adult ♀ skin and skull from Madehani, Ukinga Mountains, north end of Lake Nyasa, Tanganyika Territory. Collected by A. Loveridge, February 21, 1930.

Description. With the general characters of *O. anchietae* of western Angola, but smaller and less brightly colored.

Head and body above dark blackish brown, with a ferruginous cast due to the mixture of long black hairs with hairs having a narrow subterminal rusty ring and a black tip. The tint is very even over the whole upper surface of the head and body and on the cheeks and sides. Backs of the ears and feet blackish brown, sparsely clad with minute blackish hairs. Tail long and slender, blackish, thinly clad with minute blackish hairs that do not conceal the scales, its lower side a very little paler. Ventral side of body and limbs, slaty with a wash of ochraceous across the chest and upper abdomen.

The skull has a slightly depressed rostrum, with broadened spatulate nasals contracting behind as in most of the species north of the Zambesi, raised supraorbital edges extending back as usual to form a marked supraorbital angle, and thence across the middle of the parietals. The combination of a single deep external groove on the lower incisors, the possession of five distinct transverse laminae on the first lower molar and seven on the last upper molar, suffice at once to place this in the subgenus *Anchotomys* (Thomas, 1918, Ann. Mag. Nat. Hist. (9), **2**, p. 208), to which at present only the single species *O. anchietae* is relegated.

Measurements. The field measurements of the type are as follows: head and body 175 mm.; tail 100 mm.; hind foot (with claws) 30 mm.; ear 20 mm. Those of the largest paratypes, both from Madehani, are: ♂ 185. 100. 30. 25 mm.; ♀ 180. 110. 30. 25 mm.

The skull of the type measures: greatest length 40 mm.; basal length 35 mm.; palatal length 20 mm.; zygomatic width 20 mm.; mastoid width 15 mm.; interorbital width 4.6 mm.; width outside

molars 7.5 mm.; nasals 14.8 x 7 mm.; upper cheek teeth (alveoli) 8.6 mm.; lower cheek teeth (alveoli) 8.5 mm.

Discussion. The eighteen specimens from four mountain ranges as listed above, appear to be the first of this Angolan subgenus to be discovered in the lake region, the Dabaga specimen carrying the range unexpectedly towards central Tanganyika Territory. While agreeing precisely in the peculiar combination of tooth characters shown by *O. anchietae* (type locality Kakonda, western Angola), these are uniformly smaller, the hind foot measuring 30 against 37 to 40 mm. in the latter, and the skull not exceeding 40 mm. instead of reaching 50 in total length; other external measurements are proportionately less (head and body in *anchietae* 240 mm., tail 120 mm.).

The coloration, also, to judge from descriptions is less intense. In general outward appearance this swamp rat is very different from the *tropicalis* group of eastern Africa, differing in its darker, richer coloration and especially in the long, slender tail, dark all around, and clothed scantily with more minute blackish hairs. In these respects it shows so close a resemblance to *O. kempi* from the Kivu region, that the two are hardly distinguishable externally. Indeed, it seems likely that *O. kempi* and *O. denti* really form with *O. anchietae* a group of very closely related species which should constitute the subgenus *Anchotomys* but so plastic are the characters of molar lamination and incisor grooving, that a classification based on these alone does not bring out the true relationship. If this interpretation be correct, *O. anchietae* extends across Africa from Angola to central Tanganyika on the south edge of the forest area, as a species with 5-laminated first lower molar and a 7-laminated last upper molar, while north of it in the Kivu region and again in the Uluguru Mountains of eastern Tanganyika its place is taken by *O. kempi* with 4-laminated first lower molar and 6-laminated last upper molar. Still farther north, in Ruwenzori East, comes *O. denti* in which the last upper molar is reduced to 5 laminae. Dollman has pointed out that in the two last species, the single groove of the lower incisors divides the tooth into an inner broader and an outer narrower section, the latter of which is nearly always the paler. This condition is less characteristic of the new subspecies, but obtains in about fifty per cent of the Madehani series and perhaps further emphasizes their relationship. Altogether this forms an interesting addition to the mammal fauna of Tanganyika Territory.

GRAPHIURIDAE

Claviglis murinus isolatus (Heller)

Graphiurus murinus isolatus Heller, 1912, Smithsonian Misc. Coll. **59**, no. 16, p. 3: Mt. Umengo, Taita Mountains, Kenya Colony.

♀ (M. C. Z. 26581) Dabaga, Uzungwe Mtns. 2. i. 30.

Native name. Mderi (Kihehe).

Discussion. This single specimen from the forests of Uzungwe is indistinguishable externally from *C. m. saturatus*, in its dark smoky coloration, which merges gradually into the slightly paler underside, faintly washed with buffy. Hollister has shown, however, that the audital bullae are smaller, and this is true also of the Dabaga specimen, which thus extends the recorded range of this race over three hundred miles to the southwest of those localities in southeastern Kenya and Mt. Kilimanjaro, whence he reports its occurrence.

Measurements. ♀ 84. 80. 15. 12 mm.

Claviglis soleatus collaris subsp. nov.

♂♂ ♀ (M. C. Z. 26373–75) Madehani, Ukinga Mtns. 24. ii. 30.

Native name. Ulengera (Kikinga).

Type. No. 26,373 Museum of Comparative Zoölogy. Adult ♀ skin and skull from Madehani, Ukinga Mountains, north end of Lake Nyasa, Tanganyika Territory. Collected by A. Loveridge, February 24, 1930.

Description. A medium-sized dormouse resembling *soleatus* of Mt. Ruwenzori and *raptor* of Mt. Kenya in the close buffy-gray fur above, the dark feet with white toes, and relatively large ears. It differs from both, however, in having the lower surface of the throat, chest and belly washed with pale ochraceous, which forms a more conspicuous buffy band across the lower throat.

Entire dorsal surface of body a buffy gray, the pelage consisting of hairs with slaty bases and a short ochraceous tip, sometimes with a very minute terminal point of black; among these are scattered all-black hairs but not enough to cause a darkening of the coloration on the middle area of the back as in *C. microtis*. A slightly dusky area just in front of each eye but not reaching to the muzzle and not extending as an ocular ring. Tail drab all around, ears dusky. Hands white, only slightly clouded on the wrist, but the feet with the entire metatarsal area dark brown, the toes white. The upper lips

buffy whitish, chin white; entire lower surface of body slaty gray, many of the hairs minutely tipped with ochraceous giving a pale-buffy wash over the gray, which is so much developed across the lower throat as to give a buffy collar. The type has, abnormally, a tuft of white hair at the back of the elbow, perhaps as the result of a wound.

Skull. The skull measures: greatest length 25.0 mm.; basal length 20.6 mm.; palatal length 10.0 mm.; zygomatic width 14.0 mm.; mastoid width 12.1 mm.; upper cheek teeth 4.0 mm.; lower cheek teeth 3.4 mm.; width across upper molars 5.5. mm.

Measurements. The field measurements of the type are as follows: head and body 90 mm.; tail 60 mm. but tip missing; hind foot 15 mm.; ear 15 mm. A ♂ measured 80. 45 but tip missing. 15. 15 mm.

Discussion. Hollister, in reviewing the specimens of this genus in the United States National Museum (see Bull. U. S. Nat. Mus., no. 99, p. 152, 1919), regarded *saturatus* and *raptor*, both of which occur on Mt. Kenya, as subspecies of *murinus*, supposing *raptor* to be the high-level representative, for it occurs near the upper limit of forest. Topotypes of *raptor*, however, show that in its dorsal coloration, of an even buffy gray, and in its shorter closer fur, as well as in the greater extent of dark color on the hind feet, it is of a quite different type and is undoubtedly a distinct species, the first-named form of which is probably *solcatus* of the eastern valleys of Mt. Ruwenzori, 5–6,000 feet. The Kenya representative is apparently very similar and both have the belly gray washed with whitish. This race from the Livingstone Mountains differs in its buffy-tipped hairs below, which form a more or less marked collar.

Habitat. A full account of the taking of these dormice will be found under *Hylomyscus weileri*, both rodents being found among the epiphytic growths of a giant forest tree.

PEDETIDAE

Pedetes cafer dentatus Miller

Pedetes cafer dentatus Miller, 1927, Proc. Biol. Soc. Washington, **40**, p. 113: Dodoma, Tanganyika Territory.

♂ (M. C. Z. 25988) Dodoma, Ugogo. 23. xii. 29.

Discussion. This topotype of the race *dentatus* is a fully adult male, but does not have quite such large incisors as the type, so does not bear out well this racial character attributed to it. The cranial measurements follow, with the corresponding ones of the type in

parenthesis: median upper length 85.3 (88) mm.; condylobasal length 72.2 (77) mm.; palatal length 38.7 (41) mm.; median length of nasals 31.5 (31.6) mm.; zygomatic width 53.5 (57) mm.; interorbital width 34.3 (38) mm.; width across bullae 41.5 (45.6) mm.; combined breadth of nasals anteriorly 14 (15) mm.; posteriorly 20.5 (22.8) mm.; alveolar frontal depth 33.7 (36.2) mm.; maxillary tooth row 19 (21.4) mm.; combined breadth of upper incisors at cutting edge 9.5 (10.6) mm.; of lower incisors at cutting edge 8.5 (9.4) mm.

Measurements. ♂ 410. 400. 125. 75 mm.

Parasites. Nematodes (*Trichocephalus* sp.) were found in its stomach.

Habitat. I visited the warren of springhaas just south of the station at 8 p.m. and saw two pairs of eyes by the light of the torch attached to my gun; bagged one with the first shot but the second animal decamped and though we waited in darkness for half an hour, no other springhaas appeared. We set five traps in the entrance of the burrows: four were sprung but no hares taken as they are powerful enough to wriggle out of these humane wire traps.

BATHYERGIDAE

Cryptomys hottentotus whytei (Thomas)

Georychus whytei Thomas, 1897, Proc. Zoöl. Soc. London, p. 432: Karonga, Lake Nyasa, Nyasaland.

16 (M. C. Z. 26328–43) Ilolo, Rungwe district. iii–iv. 30.
1 (M. C. Z. 26375) Tukuyu, Rungwe district. 21. iv. 39.
1 (M. C. Z. 26574) Igale, Poroto Mtns. 30. iv. 30.
1 (M. C. Z. 26573) Ujiji, Lake Tanganyika. 30. v. 30.

Native name. Ifuku (Kinyakusa and Kinyika).

Discussion. The fine series of seventeen skins and skulls of blesmols from the vicinity of Rungwe Mountain are fairly uniform in their general cinnamon-gray coloring, which is only slightly duller below, although in some the rusty tint does not extend to the under side. They apparently represent Thomas's *Georychus whytei* described from Karonga which is about sixty miles southwest of Tukuyu and Ilolo. A single specimen from Ujiji on the east shore of Lake Tanganyika also seems to be the same. This mole-rat is very similar externally to *C. hottentotus* of South Africa, but differs in its considerably broader interorbital region and in the tendency of the premaxillae to surpass the posterior end of the nasals. As elsewhere stated by Thomas, the

skull of the type was of unusual size, and in zygomatic breadth is not equalled by any of the Rungwe series. A specimen from Mt. Chirinda in southeastern Rhodesia, presented by Dr. J. H. Sandground and taken to represent *C. darlingi*, is intermediate in the characters of the frontal region between typical *hottentotus* and *whytei*, and since it seems likely that the various named forms are chiefly at least mere geographical representatives of a single widespread species, we have ventured to regard *whytei* as a subspecies. Of the series listed, four show a slight trace of albinism in the presence of a narrow white edge bordering the dorsal rim of the nose pad. One from Ilolo (26,335) is melanistic, in that the cinnamon tips are practically lacking, and the entire pelage is dark slaty, with only an indication of the buffy wash. A second specimen (26,340) is nearly similar, with, however, a slightly more marked cinnamon tint. As an interesting correlation, these are the only ones of the series which have a small white blaze on the forehead, while the first has in addition a white median spot on the belly.

Measurements. The largest ♂ measured 160. 20. 20. 0 mm.; and ♀ 160. 20. 25. 0 mm.; both are from Ilolo. As they lack external ears no measurements can be given.

Enemies. One was recovered from the stomach of a House Snake (*Boaedon lineatus*) at Ilolo.

Habitat. The mounds thrown up by these blesmols were very numerous in the gardens of the natives both at Tukuyu and Ujiji, but having secured an adequate series (there is a series in alcohol in addition to those listed above) no attempt was made to get more.

Cryptomys hottentotus occlusus subsp. nov.

16 (M. C. Z. 26557–72) Kigogo, Uzungwe Mtns. i. 30.

Native name. Fuko (Kihehe).

Type. No. 26,557 Museum of Comparative Zoölogy. Adult ♂ skin and skull from Kigogo, Uzungwe Mountains, southwestern Tanganyika Territory. Collected by A. Loveridge, January 18, 1930.

Description. A large race, resembling *whytei* but slightly larger and of a much more slaty color; the nasals are abruptly tapered posteriorly and the tips of the premaxillae hook sharply inward nearly meeting behind them.

Entire pelage slaty gray with a faint cinnamon wash above, the whole shining or silvery like that of a mole; hands and feet sparsely covered with shining whitish hairs; nose pad narrowly ringed with white.

In general the skull resembles that of its nearest relative *whytei* in the breadth across the frontal region, but the nasals and posterior part of the premaxillae are quite different, for instead of tapering gradually to a point from near their middle, the nasals increase in breadth throughout almost their entire length and then are bevelled sharply off to their median point of contact, while the ascending portions of the premaxillae, instead of continuing nearly straight backwards to end just beyond the level of the nasals, hook sharply inward, practically meeting on the mid-line behind the nasals. The audital bullae are slightly larger than in *whytei* and in adult male skulls the median and orbital ridges are more pronounced.

Measurements. The field measurements of the type are as follows: head and body 165 mm.; tail 10 mm.; hind foot 25 mm. The largest ♂ measures 170. 10. 25. 0 mm.; and ♀ 155. 10. 25. 0 mm.

The skull of the type measures: greatest length 41 mm.; basal length 34 mm.; palatal length 24.5 mm.; diastema 13 mm.; zygomatic width 25.8 mm.; mastoid width 18.2 mm.; width across frontals 12.8 mm.; interorbital constriction 8.2 mm.; nasals 15 mm.; upper cheek teeth 6 mm.; lower cheek teeth 6 mm.; greatest diagonal width of bulla 10 mm.

Discussion. In the Uzungwe region, this colony of mole-rats discovered by Loveridge appears to have developed a number of local peculiarities in color, size, and the relations of the bones of the rostrum, that are sufficiently marked to differentiate it at once from its nearest relatives to the south and west. This apparently is the most northeastern member of the genus yet discovered, although to the westward and northwestward it attains a wider distribution. Possibly its ecological niche is to some extent occupied to the northeastward by *Heliophobius* of similar habits. In all, if one includes those preserved in alcohol, more than a score of these blesmols, very uniform in color and in cranial peculiarities, were collected at Kigogo in the Uzungwe Mountains.

HYSTRICIDAE

Hystrix galeata conradsi F. Müller

Hystrix galeata conradsi F. Müller, 1910, Sitzber. Ges. naturf. Freunde Berlin, p. 314: "Mwanza and Neuwied" (Ukerewe Island), Tanganyika Territory.

♂ ♀ (M. C. Z. 27126–7) Ukerewe Id., Lake Victoria. 16–19. vi. 30.

Native name. Nogoti (Kikerewe).

Discussion. The two skins and skulls listed above are topotypes

of this form which is further represented in the Museum by three others collected at Sagayo near Mwanza. All agree in the extraordinary inflation of the nasal chamber as well as in the great breadth of the nasals which extend back about to the level of the middle of the orbito-temporal fossa. The inflation of the anterior part of the nasal cavity is obviously much greater than in a skull from southeastern Rhodesia representing *H. africae-australis* and there is no doubt of the distinction between the two forms but until a more thorough and monographic study of the African porcupines can be made, the question of their subspecific relationships must be considered as still unsettled. I have, therefore, followed Müller in making this a subspecies of *galeata* rather than of *cristata* or *africae-australis*. The matter is further complicated by Müller's naming of a specimen from Tabora, Tanganyika Territory, which is about two hundred miles south of Ukerewe, *H. africae-australis prittwitzi*. This name appears only in connection with the figure of a skull on a previous page, the new name having evidently been omitted in its proper place by a printer's error, where only *Hystrix africae-australis* appears. If the two prove to be the same, *prittwitzi* has page precedence, but the figure seems to show it as having more tapering nasals.

Père Conrads, the collector of the types, informed the junior author that all the porcupines sent by him to the Berlin Museum were collected on Ukerewe Island and *not* at Mwanza on the neighboring lake shore.

Measurements. ♂ im. 530. 80. 70. 30 mm.; and ♀ 695. 100. 100. 42 mm.

Parasites. Ticks (*Rhipicephalus simus* var. *planus* Neumann) were taken from the female on which no fleas were found; fleas were very abundant on the male.

THRYONOMYIDAE

Thryonomys swinderianus variegatus (Peters)

Aulacodus variegatus Peters, 1852, Reise nach Mossamb., **1**, p. 138: Tete, Mozambique.

♂ (M. C. Z. 26860) Ukerewe Id., Lake Victoria. 19. vi. 30.

Measurements. ♂ 430. 170. 75. 30 mm.

Discussion. The cane rat from Ukerewe Island is referred to this race on the basis of Thomas's review of the group. It covers a wide range from Uganda to the south and east.

LEPORIDAE

Lepus capensis victoriae Thomas

Lepus victoriae Thomas, 1893, Ann. Mag. Nat. Hist. (6), **12**, p. 268: Nassa, Speke Gulf, Lake Victoria, Tanganyika Territory.

♂ (M. C. Z. 27151) Madehani, Ukinga Mtns. 21. ii. 30.
1 (M. C. Z. 26545) Ukerewe Id., Lake Victoria. 16. vi. 30.

Distribution. Hares, though not necessarily of this species, were also seen at Mpwapwa, Kilimatinde, Saranda, Unyanganyi, Mangasini, Dabaga, Kigogo and on the Senjeri Pass between Tukuyu and Abercorn.

Native names. Sungula (Kihehe); *sude* (Kikinga); *kalulu* (Kinyakusa); *kami* (Kikerewe).

Discussion. The Madehani specimen is a very large male, with the ochraceous areas of nape and fore limbs slightly deeper in tone than in the younger example from Ukerewe Island which is almost a topotype.

The skull of the former measures: occipito-nasal length 93 mm.; basal length 74 mm.; palatal length 40 mm.; zygomatic width 45 mm.; mastoid width 35 mm.; upper cheek teeth (alveoli) 15.5 mm.; lower cheek teeth (alveoli) 18 mm.

Measurements. The ♂ from Madehani measured 480. 100. 110. 100 mm. No measurements were taken of the second specimen which had been skinned by the native who brought it in; unfortunately he had not saved the pads though he had left the skull in place in the skin which had only just been removed.

Enemies. While hares were nowhere abundant, less than a dozen being seen during the eight-months' trip, it is probable that more might have been collected if they were not an article of diet. Evidently the Ukerewe specimen was skinned because the captor was fearful that he might not get the body back, though I always endeavoured to make it widely known that the bodies of any animals would be returned to the vendors without deduction in the reward offered for that particular species. The Madehani hare was brought to me by two native youngsters who had surprised and killed it in its form.

Folklore. Under *Aethosciurus lucifer* one story of a hare has already been related; another, which was told me by the same old Mnyakusa was as follows. Once upon a time a man was out hunting with his three dogs when they disturbed a hare and started in pursuit. The fleeing hare eventually sought refuge in a grass hut where it perceived a cock among the rafters. "Come down here to me," said the hare.

"Why should I come down?" answered the fowl. "You are only an animal, is there any reason why I should obey you?" To this the hare made reply, "Word has just come from the Europeans that we are all to live peaceably together." "All right," said the cock "then perhaps you will come up here and sit with me." The hare attempted to climb one of the posts but failed. Just at that moment the fowl, from its elevated position, saw the three dogs approaching and exclaimed, "I see some dogs coming." "Good-bye," shouted the hare, and bolted. The cock called after him, "Why should you fear the dogs if it is, as you say, the Europeans' regulation that we should all live peaceably together."

The humour of this story is more apparent to those who are familiar with the early history of this corner of the Territory where so much intertribal fighting was in vogue until the advent of Europeans enforced law and order.

SUIDAE

Koiropotamus koiropotamus daemonis (Major)

Potamochoerus chaeropotamus daemonis Major, 1897, Proc. Zoöl. Soc. London, p. 367: Mt. Kilimanjaro, Tanganyika Territory.

2 skulls (M. C. Z. 27314–5) Kigogo, Uzungwe Mtns. i. 30.

Native name. Ngubi (Kihehe).

Discussion. Two skulls were obtained from the natives at Kigogo, one of a young animal with worn milk teeth, and the first molar in place, the other with the permanent dentition all in place except the last molar. In the younger one there is yet no sign of the bony projection behind the canine forming the wall of the groove for the tendons of the snout.

BOVIDAE

Cephalophus melanorheus lugens Thomas

Cephalophus lugens Thomas, 1898, Proc. Zoöl. Soc. London, p. 393: Urori, Usangu, Tanganyika Territory.

4 (M. C. Z. 26549, 27239–41) Nkuka Forest, Rungwe Mtn. 28. iii. & 12. iv. 30.

Native names. Asesi (Kikinga); *akasasi* (Kinyakusa).

Discussion. These specimens were taken not far southwest of the type locality, and agree closely with the original description. We regard this form as only a subspecies of *C. melanorheus*, from which

it differs in darker coloring without the contrasting white hip stripe. In color it is curiously similar to the small Chinese deer of the genus *Elaphodus*, which it resembles in the uniform blackish brown above with sharply contrasted white beneath the tail and white on the inner side of the ear, but in the antelope, the outer base instead of the tip of the ear is white.

Measurements. The larger ♂ measured 600. 90. 155. 60 mm., larger ♀ 650. 100. 160. 60 mm.

Breeding. A female shot on April 12 appeared to be nursing.

Diet. The stomach of a young male measuring 500. 70. 145. 55 mm. held vegetable matter but no milk.

Parasites. Nematodes were taken from the stomach of one male.

Enemies. Fur of this duiker was found in the fresh droppings of a leopard not far from where the animals were shot.

Habits. When scenting a human being these forest duiker emit an explosive, sneeze-like sound as they make off through the undergrowth; they are very rarely seen except by those who set out specially to seek them. I shot one female at 5 p.m. as it glided into view and paused behind a stump before crossing a trail through the forest. Though I had been sitting watching the spot I heard no sound of its coming. It dropped stone dead with a charge of No. 3 shot from a 12-bore choke barrel. An adult and juvenile male were killed with one charge of slug shot, the younger animal being concealed when the former was fired at.

SYLVICAPRA GRIMMIA subsp.

♀ (M. C. Z. 27238) Kigogo, Uzungwe Mtns. 24. i. 30.

Native name. ? Haluzi (Kihehe).

Discussion. In view of the various subspecific names applied to East African bush duikers of this species and the lack of sufficient comparable material, it seems advisable to omit the trinomial. Probably it is close to *nyansae* which was described from the Kavirondo district, Lake Victoria.

Measurements. ♀ 990. 150. 295. 114 mm.

Breeding. Shot on January 24 when it was undoubtedly nursing.

Diet. The leaves of an euphorbiaceous shrub were found in its stomach.

Parasites. There were ticks in its coat and tapeworms (*Trichocephalus* sp.) in its stomach.

Habits. Shot at 6 p.m. when it was stealing along near the edge of a patch of forest, probably having come out to feed.

Raphicerus campestris neumanni (Matschie)

Pediotragus neumanni Matschie, 1894, Sitzber. Ges. naturf. Freunde Berlin, p. 122: Ugogo, Tanganyika Territory.

♀ (M. C. Z. 27255) Near Njombe, Ubena Mtns. 6. ii. 30.

Discussion. The above specimen should be nearly typical. It has the dark coronal spot well defined though small but the eyelids are buffy whitish instead of clear white, the body bright chestnut, the neck much paler, nearly ochraceous.

Measurements. ♀ 830. 55. 220. 107 mm.

Habits. On January 31, when near Herr Fink's farm about ten miles west of Mufindi Post Office, no fewer than six of these beautiful little steinbuck were seen between 8 and 9 a.m. as we drove along the road in a motor lorry. The grass had been burnt off and fresh short grass had sprung up in the open ground between the scattered, but numerous, thickets. One pair was standing together, the other four individuals were seen at intervals; all exhibited great boldness, remaining motionless within a hundred yards of the lorry.

On February 6, when forty-five miles west of Mufindi Post Office, on the Njombe Road, a solitary female was observed resting in the grass, she rose and ran a short distance, then halted by a thicket where I dropped her dead.

Rhynchotragus kirki nyikae Heller

Rhynchotragus kirki nyikae Heller, 1913, Smithsonian Misc. Coll., **61**, no. 3, p. 3: Ndi, near Voi, Kenya Colony.

♂ (M. C. Z. 25735) Saranda, Ugogo. 20. xi. 29.
♂ (M. C. Z. 25734) Unyanganyi, Turu. 5. xii. 29.
♂ (M. C. Z. 25720) Mangasini, Usandawi. 14. xii. 29.

Native name. Nguyhuya (Kinyaturu and Kisandawi).

Discussion. This is a pale race which inhabits the dry thorn bush country, its range extending southwards into central Tanganyika.

Measurements. The largest ♂ measured 680. 30. 170. 75 mm., the juvenile from Mangasini, only 300. 25. 115. 55 mm.

Breeding. The Mangasini dikdik could have been born only a short time previously. It was brought in by a native who said that his dog had caught it. At dusk the mother came close to camp uttering a wheezing call. I prepared to take the animal out but by the time I had caught it she had bolted and to leave it in the open was to offer it to the prowling hyenas. It was observed that the young one made

no reply to the calls but during the night it emitted a whistling sound and wandered about the tent with luminous matter on its nose as well as on the fore and hind feet of the left side; presumably it had been nosing one of the phosphorescent geophilids. Though only fit for a milk diet it refused all attempts to feed it and so was chloroformed the following morning.

Parasites. Nematodes (*Setaria* sp.) were recovered from the stomach of the Unyanganyi male.

Redunca arundinum (Boddaert)

Antilope arundinum Boddaert, 1785, Elenchus Anim., p. 157: Unknown.

3 (M. C. Z. 26468, 27228–9) Ipemi, Uzungwe Mtns. 7. i. 30.
Fetus and 4 (M. C. Z. 27311, 27231–2, 35) Mwaya, Lake Nyasa. 1–7. iii. 30.

Native names. *Ngholigata* (Kihehe); *suwela* (Kinyakusa; corruption of *swara* ?).

Discussion. These specimens of the South African Reedbuck are interesting as bringing its range into the Uzungwe Mountains of south-central Tanganyika Territory. It has been reported also as far north as the Bahr el Ghazal region, but this may require confirmation.

The coloration seems to be typical of the usual fulvous or fawn condition, rather than of the more grayish type, described by Sclater as *thomasinae,* from Nyasaland, but regarded by Lydekker as a variant of the same species.

Measurements. The largest ♂ (Ipemi) measured 1,500. 270. 480. 175 mm.; largest ♀ (Mwaya) 1,410. 260. 405. 168 mm.

Breeding. The female from Ipemi contained no fetus, neither did one shot at Mwaya on March 1, which was running with a male. On March 5, however, a female was killed carrying a fetus measuring ♀ 280. 67. 91. 36 mm., and a big young one, quite able to take care of itself, was seen on the same day. On March 7, I chloroformed a young one (♀ 510. 100. 220. 70 mm.), which was brought to me, as it would not have survived the long motor-lorry journey which lay ahead of us.

Habits. South African Reedbuck were very plentiful at Ipemi at the time of our visit; half a dozen pairs were seen lying or standing on the hillsides at various hours of the day. If suddenly surprised close at hand, the male utters a loud wheezing cry as he makes off. When thoroughly alarmed refuge is sought in one of the numerous

deep ravines, more or less choked by rank grass and vegetation, with which the mountain sides are scarred. These reedbuck would not permit one to approach within two hundred yards but at anything over that distance they would stand to be shot at, trot a little way and stand again so that it was much like shooting cattle in a pasture.

At Mwaya, on the other hand, they were found in the water-logged plain which stretches from the Mbaka River to the mountains of Nyasaland. The grass was waist- and in places shoulder-high so that the animals lay low till one was almost upon them before making off and in general they appeared wild and shy. On the evening of March 7, I saw a mother and a big young one feeding near camp. They behaved very foolishly for they ran round a clump of sedges then crept into it in full view; I left them unmolested.

Kobus ellipsiprymnus kondensis Matschie

Kobus ellipsiprymnus kondensis Matschie, 1911, Mitt. Zoöl. Mus. Berlin, **5**, p. 556: Mwaya and Mbaka, Tanganyika Territory.

Kobus ellipsiprymnus lipuwa Matschie, 1911, Mitt. Zoöl. Mus. Berlin, **5**, p. 560: Mwaya, Tanganyika Territory.

4 (M. C. Z. 27102–4, 27312) Mwaya to Mbaka, Lake Nyasa. 3–4. iii. 30.

Discussion. Shot between Mwaya and the Mbaka River six miles west or northwest of Mwaya, these specimens are topotypes of both Matschie's forms. Without a sufficient series for comparison it is, of course, impossible to give a definite opinion as to the validity of *kondensis*. The characters claimed for it are: the incompleteness of the white hoof band and the dark color of the rest of the foot, while the generally less-dark coloring is supposed to distinguish it from its neighbor to the north, to which Matschie gives the name *thikae*. Lydekker lists these and various other races without being able to pass upon their status.

Measurements. The largest ♂ measured 2,150. 330. 490. 200 mm., only ♀ 2,090. 340. 480. 190 mm.

Breeding. The female shot on March 3 was running with three other does and upon dissection was found to be carrying a fetus (♀ 780. 200. 300. 120 mm.), which at most was within three days of birth. Its skin and skull were preserved.

Parasites. Nematodes (*Setaria hornbyi*) and bots were collected from the stomach of the female.

Habits. In the early morning these fine waterbuck might be found

feeding in the glades of the rather dry woodlands, but during the intense heat of noonday they retire to the vast swamps where they must lie in the water which was about a foot deep at the spot where I disturbed them. Though there was maiombo forest and dense thickets in close proximity to the swamp they evidently prefer the latter, where they were completely hidden by the sword grass which was from nine to twelve feet in height. Nor could they be approached quietly in this situation for any attempt to push through the grass resulted in noise which gave them ample warning and they would be heard splashing away but never seen.

Adenota vardoni senganus (Sclater & Thomas)

Cobus senganus Sclater & Thomas, 1896, Book of Antelopes, **2**, p. 145: Senga, northern Rhodesia.

3 (M. C. Z. 27230, 27233, 27236) near Mwaya, Lake Nyasa. 1–5. iii. 30.

Native name. Kangosa (Kinyakusa).

Discussion. This race differs from typical *vardoni*, according to Lydekker's key (1914, Cat. Ungulates, **2**, p. 268), in slightly smaller size, larger black ear-tips occupying fully one third the length of the backs of the ears, and in the generally darker color. The localities indicated in his list of specimens, however, make one skeptical of the value of these characters. Nevertheless as the three specimens from Mwaya agree in the extensive black tips to the ears, and as Mwaya, on the northwest end of Lake Nyasa is not far east of the type locality, Senga in the Upper Loangwa Valley, I refer them to that form.

Measurements. The juvenile ♂ measured 1,510. 310. 430. 160. mm., the larger ♀ 1,640. 220. 420. 150 mm.

Parasites. No parasites were found on the first lechwe, but bots were present in the stomach of a second and a tabanid was taken on the skin.

Tragelaphus scriptus massaicus Neumann

Tragelaphus massaicus Neumann, 1902, Sitzber. Ges. naturf. Freunde Berlin, p. 96: upper Bubu Valley, northwest of Irangi, Tanganyika Territory.

Young ♀ (M. C. Z. 27234) Dabaga, Uzungwe Mtns. 2. i. 30.

Distribution. Many were seen at Kigogo, a fine male in a swamp at Mwaya and tracks observed at Ilolo.

Native names. *Matu* (Kihehe); *imbarwara* (Kinyakusa).

Discussion. This specimen is very young but shows the essential pattern of the adult, with four transverse white stripes and a series of white spots on the haunches. There is, however, no nose spot, and the dark stripe on the fore legs is very faint. The neck is well haired, without bare area, but with a distinct, though small, whorl at the base dorsally where the hair is directed outward and slightly forward. This race ranges from Mombasa to Nyasaland.

Measurements. ♀ juv. 620. 100. 200. 100 mm.

Folklore. The following story was related by an old Mnyakusa and seems so peculiar as to have had, perhaps, a basis in fact. Once upon a time a woman said to her child, "Now that your father is dead I wish that you would go and hunt a bushbuck and when you have killed it, give me the skin to wear." The lad did as he was asked, was successful in the hunt and gave his mother the skin to wear. Sometime afterwards they were working together in the fields when his mother said she was tired and would rest awhile at the edge of the garden where it abutted on the forest. As she was sleeping, some hunters came along and catching sight of the bushbuck's skin through the bushes, cast a spear which killed the old woman. "What do you mean by killing my mother in her own garden?" cried the son to the hunters, "you owe me much for this." As a result of their mistake the youth profited greatly for he was given cows, a goat and other things by way of compensation.

ELEPHANTIDAE

Loxodonta africana knochenhaueri (Matschie)

Elephas africanus knochenhaueri Matschie, 1900, Sitzber. Ges. naturf. Freunde Berlin, p. 197: Tanganyika Territory.

Foot skin (M. C. Z. 27318) Ukerewe Id., Lake Victoria. vi. 30.

Discussion. The skin of an elephant's foot from Ukerewe Island was presented to the museum by Père Conrads, being from one of the animals killed (shortly before Mr. Loveridge's visit) by order of Sir Donald Cameron, who had the whole herd exterminated. This specimen is of interest on account of the reputed racial difference of the island animals from those of the adjacent mainland. No doubt, however, at times of unusually low water, elephants could have crossed the separating channel, and it is hardly to be doubted that this is the

same as the animal of Tanganyika Territory for which the proper name is perhaps that given above. The systematic value of the variations in ear outline of African elephants is, however, very questionable, but Matschie has adduced skull characters as well, which he believed distinctive of this race. Notwithstanding the generally naked appearance of elephant hide, it is in fact beset with short scattered hairs, even the foot is well studded with them.

PROCAVIIDAE

Procavia matschiei Neumann

Procavia matschiei Neumann, 1900, Zoöl. Jahrb. Syst., **13**, p. 555: Mwanza, Tanganyika Territory.

♂ (M. C. Z. 26556) Mwanza, Usukuma. 4. vi. 30.

Discussion. In the series of hyraxes from Mwanza, is a single topotype of *P. matschiei,* briefly characterized by Neumann. The species is very different in color from those of the *brucei* group, of a general pale yellowish brown, or olive brown, with a yellowish-white dorsal spot, the forehead a darker brown, the face grizzled gray and brown like the feet. This hyrax is of large size and a member of the big-toothed group. The skull (in stage viii) measures: greatest length 94 mm.; basal length 91 mm.; palatal length 50 mm.; zygomatic width 55 mm.; mastoid width 37 mm.; across molars 33 mm.; upper cheek teeth 40 mm.; lower cheek teeth 41 mm. In the skull, the temporal ridges have met at the occiput.

Measurements. This ♂ measured 550. 0. 70. 30 mm.

Parasites. Nematodes (*Crossophorus collaris*) were present in its stomach.

Heterohyrax brucei victoria-njansae Brauer

Heterohyrax brucei victoria-njansae Brauer, 1917, Sitzber. Ges. naturf. Freunde Berlin, p. 299: Nyangesi, Mwanza, Tanganyika Territory.

7 (M. C. Z. 26482, 26529, 26902, 26904–7) Mwanza, Usukuma. 6. vi. 30.

Discussion. This series of four males and three females of the *brucei* group should represent Brauer's *victoria-njansae,* the types of which were from Nyangesi, Mwanza and Mondo. They are distinguished from *prittwitzi* by the more obvious yellowish wash of the throat and belly, a tint that extends to the paler areas of the muzzle and ocular regions as well. From the neighbouring race

diesneri of Speke Gulf, they differ further in having gray bases to the belly hairs as well. The differences claimed for these three races, though not very well marked, seem nevertheless appreciable in the series at hand. One young one is very much darker than the adults.

Measurements. The largest ♂ measured 480. 0. 70. 30 mm.; the largest ♀ 440. 0. 70. 30 mm.

Breeding. Only one of the females held fetuses, and these (two) were well developed. The ♂ measured 160. 0. 28. 15 mm.; the ♀ 160. 0. 27. 16 mm. A native brought in a young ♂ hyrax which measured 230. 0. 40. 22 mm.

Parasites. Worms (*Crossophorus collaris*) were present in their stomachs.

Habits. This series was shot on the rocks an hour's walk north of the town yet close to the lake shore. When walking back to camp in the moonlight I was astonished to hear these hyraxes calling with a musical and attractive bird-like note; they are very noisy creatures and are able to utter a great variety of sounds.

Heterohyrax brucei diesneri Brauer

Heterohyrax brucei diesneri Brauer, 1917, Sitzber. Ges. naturf. Freunde, Berlin, p. 298: Speke Gulf, and vicinity, Lake Victoria, Tanganyika Territory.

♂ (M. C. Z. 26903) Ukerewe Id., Lake Victoria. 12. vi. 30.

Discussion. Brauer in his description of this race mentioned no type specimen nor type locality. He had specimens, however, from Ukerewe Island, two localities on Speke Gulf and others from the Serengeti Plains. He states that it differs from the race *victoria-njansae* in the white instead of whitish-gray belly and in the much shorter interparietal. The single specimen obtained by Loveridge on Ukerewe Island does, indeed, differ from the Mwanza series of the latter in having the belly hairs white to the roots instead of being whitish with gray bases. In other respects the two forms are essentially alike in color, but if the character mentioned is constant, the race *diesneri* may be considered valid. The specimen, a male, is in stage viii, and is of maximum size. Its skull measures: greatest length 85 mm.; basal length 81 mm.; palatal length 44 mm.; zygomatic width 50 mm.; width across molars 17.5 mm.; mastoid width 35 mm.; upper cheek teeth 34.5 mm.; lower cheek teeth 34 mm.

Measurements. ♂ 480. 0. 65. 35 mm.

Habits. These animals are somewhat scarce on the island, though the people say that they do not eat them. When contrasted with

the numerical abundance of the allied race found near Mwanza township the relative scarcity of hyrax upon the island is surprising.

Heterohyrax brucei prittwitzi Brauer

Heterohyrax brucei prittwitzi Brauer, 1917, Sitzber. Ges. naturf. Freunde Berlin, p. 299: Kilimatinde; Mpwapwa and Uhehe, Tanganyika Territory.

5 (M. C. Z. 25834–5, 25837–9, 26852) Kilimatinde, Ugogo. 27. xi. 29.
3 (M. C. Z. 26856–8) Unyanganyi, Turu. 5. xii. 29.
2 (M. C. Z. 26548–9) Dodoma, Ugogo. 23. xii. 29.

Native name. *Pimbi* (Kinyaturu).

Discussion. Brauer separates as a subspecies, *prittwitzi*, the form of *Heterohyrax brucei* at Kilimatinde, Mpwapwa and Uhehe on the ground of very short dorsal portion of the supraoccipital (less than 3.5 mm. long) and faint yellowish tint of the whitish under surfaces. The series of topotypes (to select Kilimatinde as the type locality) secured by Loveridge includes immatures and adults, which seem to differ also from neighboring races in the very pale shoulders and large extent of the pale area behind the ears, the great length of the ochraceous median line and the ochraceous, rather than whitish, supraorbital patch, which is so extensive as nearly to form a ring about the eye.

Two others from Dodoma to the east and three from Unyanganyi slightly farther north, come from within the range of this form as defined by Brauer.

The character mentioned by Brauer, of the very short dorsal portion of the supraoccipital, seems to hold on the average, although in one adult the length is 4 mm.

Measurements. The largest ♂ (Kilimatinde) measured 420. 0. 65. 33 mm.; largest ♀ (Unyanganyi) 490. 0. 70. 36 mm.

Parasites. In all three localities these hyraxes were infested with nematodes (*Crossophorus collaris*); in addition the Dodoma specimens held *Hoplodontophorus flagellum*, *Theiliana brachylaima*, and *Setaria* sp.

Habits. At Kilimatinde these animals were exceedingly shy and I only obtained the series by waiting quietly until they should emerge from their retreats among the rocks in the dry bed of the river, and at dusk by intercepting three which were out feeding some little distance from their rocks; these were all shot on the run. Salimu actually secured the pair from Dodoma by shooting with dust shot from a .410 collecting gun.

Heterohyrax lademanni Brauer

Heterohyrax lademanni Brauer, 1917, Sitzber. Ges. naturf. Freunde Berlin, p. 298: Mwakete, Livingstone Mtns., etc., Tanganyika Territory.

♂♂ ♀ (M. C. Z. 26457, 26901, 26916) Rungwe Mountains. 4–5. iv. 30.

Discussion. This, as Brauer says in describing it, is colored much like *Dendrohyrax validus*, of which, through the kindness of Mr. G. S. Miller, Jr. and Dr. R. Kellogg, I have been able to examine topotypes from Mt. Kilimanjaro. It is, however, although equally dark-colored above, and dull ochraceous below, a much grayer animal, lacking the rich ochraceous tones of *D. validus*, while its skull is that of a *Heterohyrax*, without sign of the interparietal even in immature animals of stage vi or vii, and with the postorbital process separate from the jugal. Compared with skulls of *H. brucei*, an obvious characteristic is that the temporal ridges are nearly parallelsided on the parietal walls and look as if they would not meet even in old age.

This species, like *Aethosciurus lucifer*, seems to be one of restricted range in the Livingstone Mountains and the adjacent region. Brauer's original specimens came from Mwakete in the Livingstone Range and Milow, Msangwa and Mlando in Upangwa just to the east. Brauer states that they live in trees, which is probably correct, but Loveridge found them among moss-grown rocks outside the forest.

Measurements. The larger ♂ measured 480. 0. 75. 35 mm.; and the ♀ 380. 0. 65. 30 mm.

Parasites. Nematodes (*Inermicapsifer* sp.) were found together with cestodes in their stomachs.

Habitat. These hyrax were obtained after an hour's quick walking from my camp in the Nkuka Forest, along the edge of the forest in a northerly direction. The spot where they are most abundant is on the slopes of Rungwe where a square mile is strewn with volcanic boulders, presenting a sharp rough surface and often a jagged edge. Progress across this area was very difficult for many of the rocks were loosely balanced and tipped up when stepped upon, shrubs and even stunted trees grew in profusion. In fact some areas were so densely overgrown with vegetation as to be impenetrable and one was reminded of similar spots in Massachusetts usually given over to cat-thorn; though here, fortunately, there was no thorn, and brambles were comparatively rare. A further reminder of home was the presence of numerous webs of caterpillars in the trees! All the rocks provided a base for lichens of many different species and most of them were

overgrown with moss as well. This moss often concealed crevices, which were many feet in depth, between the boulders, and sometimes when one stepped upon an apparently flat surface the moss would slip and slide away down a concealed slope. Such accidents caused one to sit down suddenly and if upon a patch of moss the result was the same as sitting upon a wet sponge.

Progress was often similar to a scramble over seaweed-covered rocks at low tide, though here one was hampered by carrying a gun. At last a hyrax was observed quietly watching us from a distance of a hundred feet away; apparently they are not nearly so shy as those on the kopjes at Dodoma and elsewhere but, as I only secured this individual, others may have been present and slipped away unseen.

A striking difference was to be observed between the dens of *lademanni* and those of the *brucei* races in the Central Province. While those of *brucei* are foul smelling and surrounded by the excrement accumulated over a period of years, these dens on Rungwe — owing doubtless to the constant downpour of rain — are clean and almost entirely free of excrement, which must get washed down into the depths of the larva formation. Presumably as a corollary to these conditions the pelts of these Rungwe hyrax were clean and free from disease and no fleas or other ectoparasites were observed.